

Nebraska Information Technology Commission

**Government Technology Collaboration Fund
Grant Request**

Project Title	Nebraska Geospatial Data Sharing and Web Services Network
Agency/Entity	Office of the CIO

A Proposal

Establishing a Nebraska Geospatial Data Sharing and Web Services Network

The screenshot shows the Nebraska.gov website header with the text "Nebraska.gov The Official Website of Nebraska" and "GEOSPATIAL DATA SHARING WEB SERVICES NETWORK". Below the header is a blue banner with a world map on the left and a list of services on the right: "FEDERAL GEOSPATIAL DATA", "EROS DATA CENTER", "ESRI GEOGRAPHY NETWORK", "GOOGLE MAPS", and "VIRTUAL EARTH". Below the banner are three columns: "MAPS" (blue header), "DATA" (green header), and "HELP" (orange header). Each column contains three lines of placeholder text. At the bottom left is a map of Omaha, Nebraska, with a location marker for "Quest Center Omaha" and a date of "April 3-5, 2007". At the bottom center is an image of a telephone. At the bottom right are the labels "ADDRESS PHONE NUMBER" and "GEOSPATIAL BLOG".

Graphic: courtesy of Jeff Arnold, Geoage

Section 1: General Information

Project Title	Nebraska Geospatial Data Sharing and Web Services Network
Agency (or entity)	Office of the CIO

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Section 2: Executive Summary

This proposal is a request for partial startup funding of a two-year project to establish the Nebraska Geospatial Data Sharing and Web Services Network and to lay the foundation for its long-term sustainability. This project is a collaborative interagency, intergovernmental project to develop an enterprise-level GIS/Geospatial Data Sharing Network and Web Services portal for Nebraska. Geospatial data is data that contains information about the physical location (street address, latitude/longitude, etc.) of data elements and can be mapped and/or integrated with other data based on common or proximate locations. This geospatial data portal will facilitate interactive data access and exchange between state, local, federal agencies, the private sector and the general public. The project will provide for both private/secured and open data access protocols for specific datasets. The project will utilize the latest online GIS (Geographic Information System) mapping technologies to provide a foundation upon which public agencies can build their own agency-specific online geospatial analysis/mapping applications. Agency applications could be for either external data/map sharing and/or internal-only use and they could be built to rely on agency-only data or use the data-sharing network to integrate data from multiple sources.

Some agencies currently provide online data access and/or online GIS/mapping services, and the project will not duplicate those efforts, but will instead provide interactive links to those existing services through the geospatial portal. Where agencies do not currently provide online data access or online mapping services, the project will provide agencies with the opportunity to store their geospatial data in a data repository. This data could then be made available through the data-sharing network and web mapping services to other entities — in either an open or secure environment. The project will also provide limited technical assistance to help agencies establish online linkages to the data-sharing network and develop online applications based on the project’s infrastructure and access to a wide range of geospatial data.

Section 3: Goals, Objectives, and Projected Outcomes (15 Points)

1. Describe the project, including:
 - Specific goals and objectives;
 - Expected beneficiaries of the project; and
 - Expected outcomes.

Goal. Develop a Nebraska enterprise-level geospatial web portal, with Internet mapping and data services, to serve the users of Nebraska related GIS/geospatial data and enable those users to efficiently and reliably find, access, display, and build public information applications utilizing the geospatial data maintained by a wide variety of state, local and federal agencies.

Objectives of this two year project

- 1. Create Data-sharing Network.** Create an online geospatial data-sharing network, which will allow public agencies to share their geospatial data with other public agencies and/or the public and the private sector via live interactive links to their most up-to-date data.
- 2. Develop Data-sharing Security Protocols.** Develop data access security protocols and mechanisms for the geospatial data-sharing network, which will enable data-sharing agencies to allow either full open public access and/or password-controlled access to specific datasets and/or functionalities.
- 3. Provide Enterprise Internet Mapping Services.** Implement an enterprise-level online GIS Internet mapping service to enable public agencies to share/publish/display their geospatial data and to enable users to combine, map, analyze, display and download geospatial datasets from multiple agencies.
- 4. Establish Enterprise Geospatial Data Repository.** Develop an enterprise-level geospatial data repository, which will allow public agencies to maintain up-to-date copies of selected agency geospatial datasets on enterprise data servers and provide online access to those datasets through the data-sharing network and/or the GIS Internet mapping service.
- 5. Empower Public Agencies.** Strengthen the capability of public agencies to fulfill their missions by providing them with new tools to develop customized, agency-specific online GIS applications through the utilization of the enterprise-level infrastructure, technical support, and access to data from multiple agencies that will be provided by this project.
- 6. Improve Public Services.** Improve public services by enabling the general public and other agencies to access and display an agency's information via a more user-friendly, intuitive graphical map interface rather than tabular data formats. Make public policy implementation more consistent and coordinated across state and local agencies by making commonly needed, up-to-date data more readily accessible to all.
- 7. Save Public Resources.** Save public resources by making these public investments for hardware, software, and technical support resources at the enterprise level and thereby minimize the need to duplicate these investments at every public agency. Save resources by reducing the likelihood of duplicate data investments, by making it easier to reliably find and access similar geospatial data that is available at other agencies. Save resources by developing data-sharing protocols at the enterprise level instead of the individual agency-to-agency level, which would then need to be revised or synchronized when other agencies' data-sharing protocols conflict.
- 8. Facilitate Data-sharing.** Facilitate data-sharing between public agencies at the state, local and federal level by making it easier to find and access data of the specific type of data needed that may be available at another agency. Facilitate data-sharing by requiring data listed on the data-sharing network to be documented with formal metadata (data about the data). Facilitate data-sharing by arranging, in advance, specific data-sharing agreements, which outline the understandings related to sharing of a specific dataset.

Expected Beneficiaries:

Public agencies will gain reliable access to current geospatial data that is maintained by others and to an online enterprise-level geospatial applications development platform.

Public agencies that currently do not have the technical expertise, hardware, software, and/or collaboration agreements with other agencies will gain an enhanced ability to display and analyze geospatial data at a minimal startup cost for the agency,

Private Sector will gain enhanced access to public information in a more intuitive and graphically enabled format more suited for making their business decisions.

General Public will gain enhanced access to public information presented in a more intuitive graphical mapping format.

Expected Outcomes:

An Enterprise-level GIS/Geospatial Data Sharing Network and the Web Services portal which will address the expanding needs of public/private Nebraska GIS users and applications are the primary expected result of this project. Increased efficiency, reduced duplication, expanded services, and increased access to existing state, local and federal Nebraska-related geospatial data is also expected. This Data Sharing Network portal will facilitate intergovernmental access and integration of geospatial data from a wide variety of state/local and federal agencies and serve a wide range of public applications requiring current geospatial data.

2. Describe the measurement and assessment methods that will verify that the project outcomes have been achieved.

The Nebraska GIS Steering Committee, with the support of the Office of the CIO, will provide oversight and will establish policy and standards for implementation and operation of the **Nebraska Geospatial Data Sharing and Web Services Network**. Day-to-day management will be guided by an intergovernmental advisory committee identified by the Steering Committee.

A preliminary two-year timeline of project milestones and deliverables has been developed by the Project Team. These will be reviewed and refined when the project technical lead and support staff become available. A summary of these proposed deliverables is provided below. While these milestones and deliverables very well may need to be adjusted as the project progress, they will provide a visible means of verifying project outcomes that have been achieved. A more detailed breakout of this preliminary two-year project timeline and milestones is available in Section 6, question 10.

Year 1 Deliverables

- Staff the project and develop administrative model
- Develop initial proposal for overall Project Architecture
- Initial development of standards (e.g., data exchange, network, documentation)
- Initial assessment of security needs
- Identify and acquire hardware and software for Year 1
- Initiate data-sharing agreements process
- Establish network for data exchange
- Build and populate repository storage as necessary
- Build and populate Phase 1 web site for data exchange
- Hold workshops for users – training and system assessment
- Prepare a report detailing lessons learned, standards adopted, and needs to be addressed during the next project phases

Year 2 Deliverables

- Conduct user's assessment of Year 1 accomplishments/prototype portal
- Enhance automated data access with additional non-sensitive data (e.g., aerial and satellite imagery, dynamic data such as climate and drought data)
- Refine requirements for operations and maintenance and acquisition of initial dedicated technical staff resources

- Finalize processes for moving data between participating agencies
- Finalize standards development
- Finalize security processes and protocols
- Finalize administrative model and needs (long term funding plan)
- Finalize data-sharing agreement protocols
- Finalize requirements for operations and maintenance
- Initiate sharing of web-mapping services and base geospatial information from the open public access/view component of the project with GOS and The National Map.
- Hold workshops for users – training and system assessment
- Prepare a report detailing needs to be addressed during the next project phases

3. Describe the project's relationship to your agency comprehensive information technology plan.

This Nebraska Geospatial Data Sharing and Web Services Network project proposal has been developed by the Office of the CIO, in conjunction with, and in response to, an NITC GIS Shared Services initiative jointly sponsored by the NITC State Government Council and the Nebraska GIS Steering Committee. The Office of the CIO worked with these two IT coordinating entities to convene a GIS Shared Services Working Group to develop a proposal for implementing an enterprise-level Internet mapping service and geospatial data-sharing network, which was defined as a desired Shared Service in the 2006 NITC Statewide Technology Plan. Most recently, this GIS Shared Services initiative was outlined on page 52 of the NITC's Statewide Technology Plan, *Digital Nebraska: Envisioning Our Future 2007 Update*.

Implement Geographic Information System (GIS) as a shared service.

Action: *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.*

Participating Entities: *State Government Council; GIS Steering Committee*

Timeframe: *Follow-up implementation planning in 2007.*

Funding: *Initial planning should be possible with existing resources available for agencies currently providing or developing Internet mapping services. More detailed planning and implement may require additional resources, which would become clear as a result of the initial planning.*

Status: *Continuation. Interagency working group has developed a consensus Project Charter and an initial pilot demo of a geospatial data exchange and web services network. A \$43,000 grant has been secured.*

Section 4: Project Justification / Business Case (25 Points)

4. Provide the project justification in terms of tangible benefits (i.e. economic return on investment) and/or intangible benefits (e.g. additional services for customers).

A high percentage of the decisions made in government and industry, and many day-to-day decisions made by individuals, are substantially based on analyses of geospatial data. These include decisions related to property valuation and taxation, redistricting, drought management, grazing management, school bus routing, economic development, water pollution mitigation, water rights management, soil

conservation, wildfire risk assessment, dispatching emergency vehicles, homeland security, law enforcement, public health and literally hundreds of others. GIS technology cuts across virtually all of the social and natural sciences, business, agronomy, medicine, planning, law, emergency services, engineering and computer science – in short, every area of endeavor in which maps have traditionally been employed. Today, GIS is one of the fastest growing information technologies.

Much of the power of GIS lies in its ability to facilitate integration and analysis of data from multiple sources. As the use of GIS has expanded across Nebraska (Table 1), the need for users to quickly and reliably identify, access and share data across institutional and jurisdictional boundaries has become acute.

Table 1. Some Nebraska Agencies Using GIS

Conservation and Survey Division, University of Nebraska-Lincoln	Lincoln Electric System
Nebraska Department of Environmental Quality	Hastings/Adams County
Nebraska Department of Health and Human Services	Lincoln/Lancaster County
Nebraska Department of Natural Resources	Omaha/Douglas County
Nebraska Department of Roads	Grand Island/Hall County
Nebraska Emergency Management Agency	Scottsbluff/Scotts Bluff County
Nebraska Game & Parks Commission	Kearney/Buffalo County
Nebraska National Guard	Sarpy County
Nebraska Natural Resources Districts	Merrick County
Nebraska Department of Property Assessment and Taxation	U.S. Army Corps of Engineers, Omaha District
Nebraska Public Service Commission	U.S. Geological Survey Nebraska Science Center
Nebraska Public Power District	U.S. Environmental Protection Agency
Nebraska State Data Center, University of Nebraska-Omaha (census data)	U.S. Department of Agriculture Farm Services Agency (Nebraska Office)
Nebraska State Surveyor's Office	U.S. Department of Agriculture Natural Resources Conservation Service (Nebraska Office)
U.S. Fish and Wildlife Service (Nebraska Office)	Resources Conservation Service (Nebraska Office)
Omaha Public Power District	U.S. Department of Agriculture Farm Services Agency (Nebraska Office)

The challenge of facilitating broad and easy access to the growing array of geospatial data is not limited to Nebraska. Most states and federal agencies, and many local governments are struggling with how best to address this need. The federal government has taken the lead in attempting to resolve such issues among federal agencies. The most noteworthy efforts include **Geodata.gov (Geospatial One-Stop)** (<http://gos2.geodata.gov/wps/portal/gos>) operated under the auspices of the Federal Geographic Data Committee and **The National Map** (<http://nationalmap.gov/>) developed by the U.S. Geological Survey. In addition, the Environmental Systems Research Institute (ESRI), a private GIS software firm, provides the **Geography Network** (<http://www.geographynetwork.com/>). These portals generally provide a variety of tools to facilitate searches for data and often allow users to view and download data. Datasets developed by federal agencies are often readily accessed with these sites, but data from state and local governments is only sporadically available.

Many states have, in recent years, developed geospatial data portals that emulate, and often improve on, services offered by the national portals. Such sites are tailored to meet specialized needs of each state's agencies and other clients.

Table 2. Some Existing State Geospatial Data Portals

California Spatial Information Library – <http://gis.ca.gov/index.epi>
North Carolina One Map - <http://www.nconemap.com/>
Delaware Geospatial Information Clearinghouse - <http://maps.rdms.udel.edu/Portal/>
Arkansas GeoData Clearinghouse - <http://www.geostor.arkansas.gov/Portal/index.jsp>
Missouri Spatial Data Information Service - <http://www.msdis.missouri.edu/>
Kansas Geospatial Community Commons - <http://www.kansasgis.org/>
Wisconsin Land Information Clearinghouse - <http://www.sco.wisc.edu/wisclinc/index.php>
Arizona GeoData Portal - <http://agic.az.gov/portal/main.do>
Kentucky GeoPortal - <http://kgsweb.uky.edu/arcimsSearch.asp>

A few agencies in Nebraska have made significant efforts to assist GIS users in identifying and accessing selected data. On a statewide basis, the most noteworthy is the work of the Nebraska Department of Natural Resources (NDNR) which has continually enhanced its Data Bank over the past 20 years (<http://www.dnr.ne.gov/databank/geospatial.html>). The Conservation and Survey Division (CSD) of UNL has also provided a web site that assists users in finding and acquiring geospatial data (<http://csd.unl.edu/general/gis-datasets.asp>). The Center for Advanced Land Management Information Technologies (CALMIT) at the University of Nebraska-Lincoln uses IMS (Internet Map Server) technology to provide access to selected satellite imagery and to datasets on land use (<http://www.calmit.unl.edu/cohyst/>). The Nebraska Game & Parks Commission (NGPC) has recently begun to implement an IMS (Internet Map Server) site to access some of that agency's data.

Locally, the City of Lincoln and Lancaster County have been leaders in developing user access to local government GIS data (<http://ims.lincoln.ne.gov/gisweb/home.htm>). The City of Omaha/Douglas County, Sarpy County, Scottsbluff County, and others are also developing online access portals to local GIS data. And regional agencies such as the Lower Platte North Natural Resources District have implemented extraordinarily useful IMS-based tools such as NRD MapMaker (<http://www.lpnrd.org/projects/gis/mapmaker.html>).

Although several Nebraska agencies have made much progress in GIS and some provide online access to geospatial data, no site currently provides anything close to comprehensive access to the Nebraska-related geospatial data maintained by local, regional, state and federal agencies. At the present time, no Nebraska agency is charged with the responsibility for operating such a site or funded to provide such services.

Because of the lack of such a comprehensive Nebraska geospatial portal, it is often difficult for agencies to find and arrange for access to needed existing data. It is also difficult to assure that one agency has a copy of the most recent version of a dataset that is maintained by another agency. Consequently, many agencies expend considerable technical resources in finding, accessing and maintaining up-to-date versions of existing geospatial datasets, or in some cases duplicating existing datasets. While it will undoubtedly take a period of time to develop the interagency relationship that will allow anything near a comprehensive geospatial portal to be developed, this intergovernmental project is designed to put in place the technical foundation and the initial intergovernmental coordination and agreements necessary to build and sustain such a portal.

In many ways, this proposed project reflects the goals outlined in the NITC mission statement:
"The mission of the Nebraska Information Technology Commission is to make the State of Nebraska's information technology infrastructure more accessible and responsive to the needs of its citizens, regardless of location, while making investments in government, education, health care and other services more efficient and cost effective."

5. Describe other solutions that were evaluated, including their strengths and weaknesses, and why they were rejected. Explain the implications of doing nothing and why this option is not acceptable.

Several nuances/options were considered in developing a proposal which was consistent with the charge of the NITC GIS Shared Services action item to "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".

Centralized versus Decentralized Data Repository. Among the options evaluated was a design consideration as to whether the system would be designed around a requirement that all served geospatial data would be hosted by and served from an enterprise-level geospatial data repository server(s). This option was ultimately rejected in favor of allowing agencies the option of either copying data to and serving data from an enterprise-level data repository or allow agencies to arrange for online linkages, through the geospatial portal, to their data via existing online data and/or mapping services. Providing linkages to existing agency online data and/or mapping services make it more likely that the most current version of the data will be accessible to users. Requiring all data to be stored on an enterprise data repository would have significantly increased the storage and management requirements related to maintaining a data repository. Some agencies have also expressed reluctance to relinquish control of their sensitive data by copying it to a data repository server. On the other hand, by building an enterprise-level data repository in the proposed system design, the project will enable agencies that do not currently provide online data and mapping services to partner in this effort by making their data available through the data repository. Some agencies that currently have online data services have also indicated that they may choose to use the data repository, as a means to minimize the impact of system users upon their internal data servers. Other agencies have expressed an interest in potentially using an automated update of their data in the data repository serving as another means of data backup for them.

Hardware and Software. Another nuance/option considered was the software and hardware upon which to base the development of the system. While the final decision on these items will be deferred until the technical staff for the project can have input, preliminary decisions have been made, which have provided some of the foundation for this proposal. The Working Group has preliminarily decided to base the GIS component on the relative new ESRI product, ArcGIS Server 9.2 and the system's database management functionality around SQL Server software. Additional discussion of the rationale behind these preliminary decisions can be found in Section 5, question 7.

Interagency versus Public Access. Another nuance/option considered was the degree to which this system would be designed around primarily serving the geospatial data exchange needs of state and local agencies as contrasted with a focus on providing open public access to this data. Other perspectives on this contrast might be arranging for secure data access versus arranging for providing open data access; or yet another perspective is the need to design for differing levels of GIS sophistication for the expected users of the system. The Working Group has proposed the development of a system, which will over time seek to address a wide range of expected user needs including secure and non-secure data access; user-friendly front-ends with limited geo-analytic tool availability and also providing access to and support for a wide-range of geo-analytic tools upon which agencies can develop customized applications. The Working Group also recognizes that this will involve a development process, with some of these capabilities developed prior to others.

Institutional Base for Project. Another nuance/option considered was the most appropriate institutional home for this collaborative intergovernmental project. Because no state agency currently has a clearly defined mandate to develop and maintain such an enterprise geospatial data-sharing

network, there was not an obvious choice. Several cooperating agencies had some aspects of the needed technical expertise and experience, technical infrastructure, agency mandates, and institutional management capabilities and flexibilities, but no one agency had all of these perceived requirements. For these reasons, it is proposed that this Geospatial Data Sharing and Web Services Network will be initially developed as a collaborative effort based primarily in the Office of the CIO and the University of Nebraska Center for Advanced Land Management and Information Technology (CALMIT), with active partnerships and collaboration from several state and local agencies. The Office of the CIO will provide the formal institutional home and oversight for the project and will enter into an interagency agreement with UNL-CALMIT to provide technical support services for the project. The Office of the CIO will bring to this project its supportive relationships with the Nebraska GIS Steering Committee and the State Government Council, its project management capabilities, its SQL Server capabilities, its flexible organizational capabilities for IT project management, and its experience in implementing interagency IT project. UNL-CALMIT will bring to this project its in-house GIS expertise, its organizational flexibility in hiring needed GIS technical support and management, and its access to a professional and student community exposed to the latest innovations in GIS technology. Other state and local agencies will be invited to be actively involved in the development and management of this enterprise service. It is proposed that an intergovernmental advisory committee will be convened by the Nebraska GIS Steering Committee to provide on-going technical and policy guidance for the development and maintenance of this enterprise-level service.

“Do Nothing” Option. Currently numerous state, local and federal agencies have purchased and/or invest in maintaining geospatial data to assist in carrying out their assigned agency mission. Some of these state or local agencies also provide limited agency-specific online access and/or Internet mapping services related to the geospatial data that they maintain. There are also many public geospatial datasets that are not currently available via online access. Most agencies also acquire copies of other geospatial datasets that have been purchased and/or are maintained by other state, local or federal agencies for use as a part of their geospatial data analyses. In most cases this transfer of geospatial data from one agency to another is accomplished via unique agency-to-agency, one-point-in-time file transfer agreements and arrangements, using either Internet download or portable hard drives. There is currently no functioning enterprise-level Nebraska geospatial portal where an agency can go to find, access and download the broad cross-section of available geospatial data related to Nebraska. The “doing nothing” option would likely result in a continuation of the slow proliferation of agency-specific online portals for their particular agency’s geospatial data and the further development of a complex web of overlapping agency-to-agency specific agreements for one-point-in-time data transfer arrangements. A considerable amount of agency technical personnel time and resources are involved in finding and arranging for these data transfers. Because these arrangements are agency specific, when another agency is interested in the same data, the processes (and therefore the technical resource requirements) start all over again.

6. If the project is the result of a state or federal mandate, please specify the mandate being addressed.

This project is not the result of a specific state or federal mandate. However, it is the direct result of a Shared Services initiative endorsed by the NITC State Government Council and the Nebraska GIS Steering Committee and included in the NITC Statewide Technology Plan. Numerous national studies and white papers have addressed the importance of GIS/geospatial coordination and have pointed to the pivotal role of strong state GIS coordinating councils in facilitating data-sharing across all levels of government. As the technology and coordinating structures have evolved, state geospatial portals, such as the one proposed in this project, are becoming a key tool for facilitating geospatial data-sharing.

Federal Geographic Data Committee’s Fifty States Initiative

http://www.nsgic.org/hottopics/fiftystates_initiative.pdf

National States Geographic Information Council - A State Model for Coordination of Geographic Information Technology http://www.nsgic.org/states/statemodel_git.pdf

Section 5: Technical Impact (20 Points)

7. Describe how the project enhances, changes or replaces present technology systems, or implements a new technology system. Describe the technical elements of the project, including hardware, software, and communications requirements. Describe the strengths and weaknesses of the proposed solution.

There are currently over 100 statewide, regional and local geospatial datasets, and thousands of aerial and satellite images, now available for Nebraska. Collectively, these datasets probably currently total at least 50 Terabytes (Tb) of disk storage (note that 10 Tb = printed collection of the Library of Congress). These data constitute an invaluable resource for the State. There is currently no central access point to find and access this wealth of Nebraska-related data.

This project will lay a solid foundation for the development of a centralized geospatial portal, which will enable users of Nebraska-related geospatial data to find, display and download available data. The project will also provide the online geospatial tools and interagency data access that will enable public agencies to develop customized online GIS applications (internal or external) to further the accomplishment of their agency missions. The project will not replace, but will build on and provide a central access point for existing, distributed online geospatial data and mapping services currently provided by state, local and federal agencies. The project will also provide a geospatial data repository which will enable agencies which maintain geospatial data, but do not currently provide online data access or mapping services related to their data to provide other agencies and the public with access to their data.

Hardware and Software. While the final decision on hardware and software will be deferred until the lead technical staff for the project can have input, preliminary decisions have been made, which have provided some of the foundation for this proposal. The two primary software components are the online GIS data/mapping server and the database management system. The Working Group has preliminarily decided to base the GIS component on the relatively new version of ESRI ArcGIS Server 9.2, which was designed specifically for this type of application. ESRI is the GIS software vendor used by the vast majority of the state and local partners in this project. The use of this software will make it very likely that the software used by these project partners will be compatible with this online GIS server engine and that the project partners will be familiar with the software tools. The one significant exception to this pattern is the Nebraska Department of Roads that primarily uses Intergraph and GeoMedia GIS software. However, NDOR also uses ESRI products and feels comfortable that data-sharing protocols can be arranged. It is expected that a relatively high-end server will be required for the hosting the ArcGIS Server software, but a decision on the specifics of this hardware will be deferred until lead GIS technical support staff can have input. The Working Group has also made a preliminary decision to build the system's database management functionality around SQL Server software. Drivers for this decision include: costs; the availability of SQL Server software, related hardware, and technical assistance within the Office of the CIO; the fact that the existing OCIO SQL Server-related hardware/software capabilities would allow for considerable flexibility in starting small, but expanding the system as it grows; and the fact that ESRI ArcGIS Server software is designed to integrate easily with SQL Server software.

Communications. The data communications network for the project will be based on Internet protocols and rely on the existing broadband network to provide connectivity between state and local agencies and existing private Internet connectivity to provide service to the general public and private sector.

8. Address the following issues with respect to the proposed technology:
 - Describe the reliability, security and scalability (future needs for growth or adaptation) of the technology.
 - Address conformity with applicable NITC technical standards and guidelines (available at <http://www.nitc.state.ne.us/standards/>) and generally accepted industry standards.
 - Address the compatibility with existing institutional and/or statewide infrastructure.

It is important to note that the number of datasets and data volume will increase annually as new data are digitized, more agencies adopt GIS, and existing datasets are updated. As more agencies use GIS, the demand for data access will increase as well. This growth trend is particularly noteworthy as more local governments adopt GIS technology and state agencies desire ready access to these highly accurate local datasets for state-level applications. This trend towards an increasing demand for online GIS capability and data access will also be heightened as more agencies become comfortable with the concept and the reliability of the proposed Nebraska Geospatial Data Sharing Network. This will result in more data being made available thru the Data Sharing Network and more agency applications being built based on the availability of that Network. The project Working Group is aware of these trends and proposes to build a system with the flexibility to adapt.

Reliability and Scalability. The adoption of ESRI ArcGIS Server and SQL Server software to should provide this proposed system with a considerable level of reliability, security, and scalability as these are leading OTS software designed with these considerations in mind. The adoption of the new version ArcGIS Server 9.2 raises some concerns of bugs to be worked through. However, since ESRI is the number one GIS software vendor and this software is a key ESRI initiative, it is likely that there will be considerable support available through ESRI to solve those problems. The Working Group decided that even given these likely problems with a significantly new software product, it did not make sense to design a new system around yesterday's technology. The proposed project is designed around the Office of the CIO SQL Server capability in part because the Working Group felt that the OCIO would take on much of the burden of providing the reliability, security, and scalability on the DMS side.

Security. One of the early project implementation foci will be developing the data/network security protocols that will allow participating partners to feel comfortable in selectively sharing geospatial data and services over the Data Sharing Network. Tools to provide that data security are available in both the ArcGIS Server and the SQL Server software and efforts will be made to build upon existing security protocols built into the state's network.

Standards. One of the major NITC technical standards that this project will impact is the requirement that state-funded geospatial data be documented with formal metadata describing the data. Data will not be made available on the Data Sharing Network unless it is documented consistent with the NITC Metadata Standard. The adoption of ESRI ArcGIS Server as a foundation software means from a practical point of view the system will be consistent with generally accepted industry standards, since ESRI is the number one GIS software vendor. However, it is also the intention of the project Working Group to develop the system such that data and mapping services will also be available according to Open GIS standards and therefore be vendor neutral.

Compatibility with Existing Infrastructure. This project will be designed to build upon and be compatible with existing infrastructure wherever practical. Existing online data and mapping services provided by public agencies will be linked through the portal. The adoption of ArcGIS Server and SQL Server software will enhance system compatibility as they are widely used. The data communication network will be based on existing services and protocols. The portal will be designed to work and communicate with national geospatial portals such as *The National Map*, Geospatial One-Stop, and the ESRI Geography Network. Efforts to comply with Open GIS standards will also increase the level of compatibility with systems that maybe somewhat less in the mainstream.

Section 6: Preliminary Plan for Implementation (10 Points)

9. Describe the preliminary plans for implementing the project. Identify project sponsor(s) and examine stakeholder acceptance. Describe the project team, including their roles, responsibilities, and experience.

Project Sponsors

Office of the CIO, on behalf of the
Nebraska GIS Steering Committee and the NITC State Government Council

Background and Proposed Implementation Approach

Following the adoption of the Shared Services — Internet Mapping Action Item by the NITC State Government Council and the Nebraska GIS Steering Committee, the Office of the CIO took the lead in convening a broad-based, intergovernmental Project Team to further develop the concept and define an conceptual approach for implementation. In 2006, this Project Team developed a Project Charter, which outlined a broad interagency vision for a Nebraska Geospatial Data Sharing and Web Services Network. This shared vision included a multi-year implementation process and recognized the need for dedicated technical staff to sustain the effort. A listing of the key members of that Project Team is provided below.

Project Team: NE CIO: Steve Henderson, Information Technology Manager, Office of the CIO
NE GIS Steering Committee/CIO: Larry Zink, GIS Coordinator
NE Dept. of Natural Resources: Steve Rathje, Senior Analyst
NE Dept. of Environmental Quality: Dennis Burling, Info. Technology Manager
and Paul Yamamoto, Infrastructure Support Analyst Senior
NE Dept. of Roads: Jon Ogden, Business Technology Support Manager and
Steve Brown, GIS Manager
NE Health and Human Services System: Chris Chalmers, GIS Coordinator
NE Emergency Management Agency: Sue Krogman, Information Tech. Admin.
NE Game and Parks Commission: Sudhir Ponnapan, GIS Specialist
NE Dept. of Agriculture: Tom Jensen, Div. Administrator, Ag. Laboratories and
Craig Romary, Environmental Programs Specialist
UNL-Center for Advanced Land Mgmt. Info Tech.: Chad Boshart, Project Mgr.
Lincoln/Lancaster County: Jim Langtry, GIS Manager, County Engineer's Office
Omaha/Douglas County: Mike Schonlau, GIS Coordinator
Sarpy County: Eric Herbert, GIS Coordinator

Although, as previously noted, some federal agencies and other states have implemented geospatial data portals, the work is technically and administratively complex. The Project Team believed that establishing a fully-functional **Nebraska Geospatial Data Sharing and Web Services Network** would take two/three years of effort and dedicated full-time staff. The Team proposed that the project be implemented in phases, each phase designed to achieve concrete deliverables and provide specific advances in interagency data exchange capabilities. Each project phase will build on the previous phase(s). For example, sensitive data will not be available through the data exchange network until the later phases of the project, after security and permission protocols have been developed and tested. As part of this learning and building process, it is expected that the design of the project phases will evolve over time.

Need for Dedicated Technical Staff. In the latter half of 2006 and early 2007, a Working Group (a subset of the Project Team) continued efforts to further define and pursue early project implementation steps. While the adopted Project Charter spoke directly to the need for dedicated technical staff to support and lead the project, it also envisioned the possibility of initial steps being

taken based on existing in-house technical staff from project partner agencies. The technical complexity of the project, together with the reality of limited free time of the existing agency technical staff, lead this Working Group to prioritize the pursuit of the dedicated technical resources necessary to lead and support this project. It became clear to the Working Group that while it was reasonable to expect existing agency technical staff to support their particular agency's linkage and participation in the project, it was not realistic to expect those agency technical staff to develop and support the central enterprise-level components of the project. This funding proposal is a response to that perceived need to secure the services of the dedicated technical resources to lead and support this project. See Appendix 1 for the responsibilities and qualifications identified by the above committee as necessary for the Project Manager hired for this project.

In the meantime, the Working Group has continued to flesh out the concepts and the implementation steps related to achieving the vision outlined in the initial Project Charter. The Working Group is proposing the development of a data-sharing and web services system with the following characteristics.

Distributed System. A distributed system which will allow public agencies the option of either copying data to and serving data from an enterprise-level data repository or allow agencies to arrange for online linkages, through the geospatial portal, to their existing online data and/or mapping services.

System Designed for Range of User Needs. The development of a system, which will over time seek to address a wide range of expected user needs including both secure and non-secure data access. A system designed to provide both user-friendly front-ends with limited geo-analytic tool availability for non-sophisticated GIS users and also provide agencies with access to and support for a wide-range of geo-analytic tools upon which the more GIS sophisticated agencies can develop customized applications. The Working Group also recognizes that this will involve a development process, with some of these capabilities developed prior to others.

Online or Desktop Use. The proposed system will allow users to find, access, and download available geospatial data onto their desktop. The system will allow users to display and conduct geospatial analysis online using data from multiple sources and/or the system will allow users to perform geospatial analysis on their desktop while accessing desired datasets via the data-sharing network.

Compatibility with Existing Infrastructure. The GIS component of the proposed system will be based on the ESRI product, ArcGIS Server 9.2 and the system's database management functionality around SQL Server software available thru the Office of the CIO. These two popular OTS software packages will insure a high degree of compatibility with existing infrastructure, database formats, and the knowledge base of agency technical staff. To further enhance compatibility, efforts will be made to also comply with Open GIS standards where practical.

Collaborative Development Model. Initial development will be a collaborative effort based primarily in the Office of the CIO and the University of Nebraska Center for Advanced Land Management and Information Technology (CALMIT), with active partnerships and collaboration from several state and local agencies. The Office of the CIO will provide the formal institutional home and oversight for the project and will enter into an interagency agreement with UNL-CALMIT to provide technical support services for the project. The Office of the CIO will bring to this project its supportive relationships with the Nebraska GIS Steering Committee and the NITC State Government Council, its project management capabilities, its SQL Server capabilities, its flexible organizational capabilities for IT project management, and its experience in implementing interagency IT project. UNL-CALMIT will bring to this project its in-house GIS expertise, its organizational flexibility in hiring needed GIS technical support and management, and its access to a professional and student community exposed to the latest innovations in GIS technology. Other state and local agencies will be invited to be actively involved in the development and management of this enterprise service. It is proposed that

an intergovernmental advisory committee will be convened by the Nebraska GIS Steering Committee to provide on-going technical and policy guidance for the development and maintenance of this enterprise-level service.

Startup Funding Development. The Working Group for this project is dedicated to developing a quality product and service that will garner the institutional support necessary to sustain the project over the long haul. The broad-based support shown in the development of the initial Project Charter for this project demonstrated both the perceived need and a willingness of agencies to support this type of service. The Project Team and its Working Group knows that to develop a IT quality product and service, dedicated skilled technical support and leadership are necessary. The challenge is how one funds the start up of an interagency, intergovernmental collaborative project, such that one can demonstrate the product, determine the costs for on-going support, and then develop the interagency buy-in to a funding model that will sustain the service. This funding proposal is based on the belief that the NITC Government Technology Collaboration Fund and the State Records Board Grant to Improve Access to Public Information are two funding sources with missions ideally suited to help fund this type of project. What is proposed is to two-year funding from both of these funds, that when coupled with other grants, state agency direct contributions and additional in-kind services will allow for the initial development of this service. During this development period, additional information will be gathered and analyzed that will allow for a sustainable funding model to be developed and implemented.

Proposed two-year startup funding package

US Geological Survey Grant	\$43,000	one-time hardware/software funds <i>already obtained</i>
NITC Collaborative Fund	\$150,000	\$75,000 for each of the first two years of the project
State Records Board	\$50,000	\$25,000 for each of the first two years of the project
State Agency Partners *	<u>\$60,000</u>	\$30,000 for each of the first two years of the project
Total two year budget	\$303,000	

* Does not include the extensive in-kind contributions that are expected from state and local agency in the form of technical support

10. List the major milestones and/or deliverables and provide a timeline for completing each.

Preliminary Project Plan

Year 1

- Identify/hire a Project Manager (Appendix1) and technical support staff
- Identify other project staff and obtain commitments of time/resources via MOAs with collaborating agencies (e.g., CIO, NDNR, DOR, UNL)
- Conduct systematic review of existing state and federal prototypes (services, navigation, administration, institutional structure, funding)
- Conduct detailed user needs assessment
- Identify datasets currently available from local, state, regional and federal agencies and establish custodians for each
- Initial development of standards (e.g., data exchange, network, documentation)
- Initial assessment of security needs
- Identify requirements for hardware and software
- Develop initial proposal for overall Project Architecture
- Identify minimum subset of datasets and services to be incorporated into initial phase
- Insure targeted datasets are documented with FGDC-compliant metadata

- Initial specification of administrative model and staffing needs
- Initiate data-sharing agreements process
- Acquire hardware and software needed for Phase I
- Establish network for data exchange
- Initiate agreements with USGS (The National Map) and FGDC
- Build and populate repository storage as necessary
- Build and populate Phase 1 web site for data exchange
- Conduct initial requirements analysis for operations and maintenance
- Hold workshops for users – training and system assessment
- Prepare a report detailing lessons learned, standards adopted, and needs to be addressed during the next project phases

Year 2

- Conduct performance analysis of Phase 1 accomplishments/prototype portal (user's assessment)
- Enhance automated data access with additional non-sensitive data (e.g., aerial and satellite imagery, dynamic data such as climate and drought data)
- Refine requirements for operations and maintenance and acquisition of initial dedicated technical staff resources
- Finalize processes for moving data between participating agencies
- Finalize standards development
- Finalize security processes and protocols
- Finalize administrative model and needs (long term funding plan)
- Finalize data-sharing agreement protocols
- Finalize requirements for operations and maintenance
- Initiate sharing of web-mapping services and base geospatial information from the open public access/view component of the project with GOS and *The National Map*.
- Hold workshops for users – training and system assessment
- Prepare a report detailing needs to be addressed during the next project phases

Year 3 (beyond current project proposal timeline)

- Implement recommendations, standards, and protocols
- Implement secure sharing of sensitive data within the network
- Implement and expand public view component (map services)
- Implement procedures for long-term maintenance and enhancement of the **Nebraska Geospatial Data Sharing and Web Services Network**. (including funding)

11. Describe the training and staff development requirements.

Existing agency staff will need at least a limited amount of training and staff development to enhance their familiarity with ArcGIS Server 9.2. As the system is developed, training is built into the annual project timeline to familiarize agency personnel on how to use the system. It is envisioned that the technical lead/support personnel hired for this project will take the lead in this training.

12. Describe the ongoing support requirements.

The project proposal is designed around a two-year project implementation process. As part of that implementation process, an assessment will be completed to define the requirement for on-going system support.

Section 7: Risk Assessment (10 Points)

13. Describe possible barriers and risks related to the project and the relative importance of each.

Risk Assessment and Mitigation (Questions 13 & 14)

14. Identify strategies which have been developed to minimize risks.

All IT projects have risks. In the previous sections a business case has been made that the best way for Nebraska to proceed in development is to build an enterprise-level geospatial data exchange network and related services. Although the recommendation was based on multiple factors of evaluation this project still has risks. What differentiates successful projects from unsuccessful is proactive assessment and mitigation of risks rather than waiting until the risks become problems. Early detection and mitigation of potential issues is much less time consuming and expensive than is waiting.

This section of the presents the first step in the process to manage risks. The following “Risk Factors Matrix” identifies risks considered in the following categories. Risk assessment for an IT project is about more than technology. Often the most risky items relate to change or leadership.

- Strategic
- Leadership
- Management
- Financial
- User Participation/Considerations
- Project Participants
- Technology

The risk factors were assessed and ranked according to whether the risk of failure associated with each particular factor is High, Medium, or Low. Mitigation strategies were determined for all risk factors determined to be High or Medium.

Risk Factors	High Risk	Medium Risk	Low Risk	Rating H,M,L	Risk Mitigation Strategies
Risk Factors - Strategic					
State Mission and Goals	Project does not support or relate to any state missions or goals.	Project will indirectly impact state goals or mission.	Project directly supports state goals or mission.	L	
Key Agency Mission and Goals	Project does not support or relate to any agency missions or goals.	Project will indirectly impact agency goals or mission.	Project directly supports agency goals or mission.	L	
Process Impact	Project will directly alter the business process.	Project will alter parts or have a slight effect on the business processes	Project will have little or no effect on the business process	M	Each agency will have the flexibility to determine the level of involvement relative to their business processes
Cultural Impact	Reluctance to change Multiple, varying expectations	Slow but steady acceptance	Readily accepted	L	

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Risk Factors	High Risk	Medium Risk	Low Risk	Rating H,M,L	Risk Mitigation Strategies
Risk Factors - Leadership					
Budget Office Executive Management Support	No support for project or major unresolved issues.	Budget Office somewhat supportive of the project.	Strong support of the project in expressed by a commitment of resources.	M	Project Team will work to demonstrate and build support for project of 2-yr period
Performance Objectives	No established performance requirements or requirements that are ill-defined and not measurable.	Some performance questions or uncertainty of performance measures.	Verifiable performance, reasonable requirements, and measures clearly defined.	L	
Commitment to Project	Project has little or no support from state leadership	Some support for project expressed but it may be temporary	State leadership strongly committed to success of project.	L	

Risk Factor	High Risk	Medium Risk	Low Risk	Rating H,M,L	Risk Mitigation Strategies
Risk Factors - Management					
Detailed Project Plan	Project plan is non-existent.	Project plan is partially completed	Project plan is in place	M	Prelim.project plan will be updated as dedicated technical leadership resources become available
Project Schedule	Arbitrary and dictated	Planned using external factors	Planned based on scope and resources	M	Plan schedule subject to securing resources for tech. lead. Will be adjusted relative to success in that area
Experience with Similar Projects	No experience with projects of this type.	Moderate experience or experience with different type projects.	Very experienced with similar projects.	M	OCIO experience with interagency IT project implementation, UNL has GIS experience, Experience will be a key factor in hiring decisions for tech. lead
Project Estimation	No real basis for estimates. Little or no verification.	Estimates based on established techniques. Little or no verification.	Estimates based on established techniques and verifiable.	M	Estimates based on established techniques but will be reviewed when technical lead becomes available
Monitoring/ QA Process	No process established or process is ignored.	Process established, not well followed, or is ineffective.	Process well-established, procedures followed, and highly effective.	L	
Change Management Process	No defined process.	Defined, but loosely followed.	Defined and followed.	M	Will be defined when technical lead personnel available
Project Size and Scope	Rapidly changing size or scope, requirements not defined.	Requirements defined and agreed to but changes to scope expected.	Requirements well established and expected to remain stable.	M	Minimum project objectives will be achieved, additional scope to be adjusted relative to resource availability

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Risk Factors – Management (cont)					
Deliverable Requirements Defined	No requirements defined for deliverables or unreasonable requirements.	Some deliverable requirements remain to be defined or are vague and immeasurable.	All deliverable requirements defined, reasonable, and measurable.	L	
Time Allocated for Development	Significant time constraints on project	Moderate time constraints on project	Adequate time is allocated to development.	L	

Risk Factor	High Risk	Medium Risk	Low Risk	Rating H,M,L	Risk Mitigation Strategies
Risk Factors - Financial					
Funding Sources and Constraints	Budget allocation in doubt or subject to change without notice.	Some questionable allocations or doubts about availability.	Funds allocated without constraints.	M	Grants funds still being sought, project will not proceed until secured
Cost Controls	Cost control system lacking or nonexistent.	Cost control system in place but weak in some areas.	Cost controls established, in place, and effective.	M	Preliminary budget items, personnel and hardware, may need to be adjusted relative to market
Economic Justification/Cost Effectiveness	Not justified or cost-effective.	Justification questionable or cost-effectiveness not completely established.	Completely justified and cost-effectiveness proven.	L	
Budget Size	Insufficient budget available to complete project as defined.	Questions remain concerning budget.	Sufficient funds available to complete project as currently defined.	M	Grants funds still being sought, project will not proceed until secured

Risk Factor	High Risk	Medium Risk	Low Risk	Rating H,M,L	Risk Mitigation Strategies
Risk Factors – User Participation/Considerations					
User Training Requirements	Training requirements have not been defined or have not been addressed.	User training needs have been considered but training or training plan is in development.	User training needs considered, training plan in place and in process.	L	

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Risk Factor	High Risk	Medium Risk	Low Risk	Rating H,M,L	Risk Mitigation Strategies
Risk Factors – User Participation/Considerations					
User Acceptance	State/court participants have not accepted any of the concepts or design details of the system.	State/court participants have accepted most of the concepts and details of the system and process is in place for user feedback.	State/court participants have accepted all concepts and details of the system and process in place for user feedback.	M	High degree of acceptance of key partners and plans in place for training and orientation
Involvement of Users	Minimal or no user involvement expected on development team.	Users on project team play minor roles or expected to have only moderate impact on system.	User staff highly involved with project team, provide significant input and have significant ownership of system.	L	
Risk Factors	High Risk	Medium Risk	Low Risk	Rating H,M,L	Risk Mitigation Strategies
Risk Factors – Project Participants					
Experience of Staff	Staff has little or no experience with projects of this type and lacks experience with hardware or software.	Project staff has some experience with projects of this type, but lacks experience with hardware or software.	Project staff is highly experienced with projects of this type, and has experience with hardware and/or software.	M	Key agency personnel very familiar with GIS, needed online GIS server skills will be contracted for with grant funds
Availability of and Experience with Productivity Tools	Productivity tools not being used or considered.	Productivity tools available but not being used to full potential, or in process of being implemented and training needed.	Productivity tools being used and staff are trained in use of tools.	M	Training will be needed for agency personnel on use of online GIS server software, technical lead being hired with this skill set
Commitment of Staff	Project staff has little or no commitment to the success of this project.	Project staff states commitments to project, but indications are that commitment is not genuine.	Project staff is highly committed to success of project.	L	
Expertise with Hardware	New hardware, little experience, different technology.	Technology similar to existing systems, and some in-house experience.	Mature technology, current in-house experience, and high experience ratio.	L	
Expertise with Software	New software and no experience with software or similar products.	Some experience with software or similar product.	High experience ratio with software or similar systems.	M	Technical lead being hired with grant funds to lead online GIS server implementation

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Government Technology Collaboration Fund Grant Request

Risk Factor	High Risk	Medium Risk	Low Risk	Rating H,M,L	Risk Mitigation Strategies
Risk Factors – Project Participants (cont)					
Availability of Users	Users not available for requested functions, e.g., testing, meetings.	Limited availability of users	Full user involvement in requested functions.	L	
Project Manager	Little or no PM experience.	Managing multiple projects.	Experienced and dedicated to project.	M	Technical lead/Project Mgr being hired with grant funds to lead online GIS server implementation
Resource Allocation	No resources assigned. Not recognized as a priority project.	Resources assigned to multiple projects. Multiple priorities.	Dedicated resources	M	Dedicated resources be sought with grant requests and state agency contributions
Staff Turnover	Little or no notice. Little or no documentation.	Some notice. Some documentation.	No loss of staff.	M	Will be a consideration when tech. lead hired, major reason for seeking two-year funding

Risk Factors	High Risk	Medium Risk	Low Risk	Rating H,M,L	Risk Mitigation Strategies
Risk Factors - Technology					
Analysis of Alternatives	Analysis of alternatives not completed, not all alternatives considered, and/or assumptions faulty.	Analysis of alternatives completed, some assumptions questionable, and alternatives not fully considered.	Analysis of alternatives completed, alternatives and options considered, and assumptions verifiable.	L	
Complexity of Requirements	Project is very complex with multiple requirements from many different users; requirements are complex and hard to define.	Project is fairly complex with some requirements more easily defined; several user groups will be aiding in the design.	Requirements are few and easily defined.	M	Need for flexibility built into project design, project partners to be actively involved in implementation, project's 2-yr timeline includes consideration of these factors
System Integration/ Interfaces	Extensive integration of systems or exchange of information or interfaces is a major part of project.	Some integration or interfaces required and/or of some importance to project.	Little or no integration or interfaces required.	H	Need for flexibility and adjustments built into project design and 2-yr timeline, project partners to be actively involved in implementation, software designed to facilitate integration

Nebraska Information Technology Commission

Government Technology Collaboration Fund Grant Request

Risk Factors	High Risk	Medium Risk	Low Risk	Rating H,M,L	Risk Mitigation Strategies
Risk Factors – Technology (cont)					
Fit with Existing Environment	Introduces new technologies to the environment.	Limited use of new technologies.	Uses proven technology that integrates well.	M	ArcGIS Server technology new to OCIO environment, Tech. lead will assist with integration
Maturity of Solution	Leading edge (in operation less than one year) or aged technology (over 5 years old).	State-of-the-art (in operation from 1-3 years).	Mature technology established and proven (in operation 3-5 years).	M	New version of ArcGIS Server, but ESRI tech support will assist
Security	Security requirements not defined.	Some security requirements defined, but complex to implement.	All security requirements defined, and simple to implement.	M	Use of data requiring security will only be introduced into the system after it matures
Platform	Completely foreign platform	Some platform unique code	Familiar platform	M	Familiarity with SQL Server, but ArcGIS Server 9.2 will be new and skills of GIS tech lead will be needed
Accessibility	Previously undefined accessibility requirements.		Accessibility requirements known and within current guidelines.	M	These issues are not yet defined and will need further study

Section 8: Financial Analysis and Budget (20 Points)

15. Financial Information

EXPENSES

The bulk of the proposed project costs are associated with an interagency agreement between the Office of the CIO and UNL-CALMIT to provide GIS Project Management and Technical Support for this project.

Interagency Agreement with UNL-CALMIT for Project Technical Support

Project Mgr/Programmer/GIS Support (100% FTE)	\$75,000	\$150,000
Principal Investigator (.05 FTE)	\$6,000	\$12,000
Subtotal - direct personnel costs	\$81,000	\$162,000

Fringe Benefits (28%)	\$22,680	\$45,360
Supplies	\$1,000	\$2,000
Computer Support and Services	\$3,150	\$6,300
Travel	\$4,000	\$8,000
Communications	\$1,000	\$2,000
Subtotal - personnel and other direct costs	\$112,830	\$225,660

Indirect Costs (10%)	\$11,283	\$22,566
Subtotal UNL-CALMIT Interagency Agreement Costs	\$124,113	\$248,226

Other Costs Beyond Univ. Interagency Technical Support Agreement

Estimated Hardware & Software Purchase Costs		\$43,000
OCIO SQL Server and Technical Support Costs	\$6,000	\$12,000

Two-Year Project Budget Total		\$303,226
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INCOME

Proposed two-year startup funding package

US Geological Survey Grant	\$43,000	one-time hardware/software funds <i>already obtained</i>
NITC Collaborative Fund	\$150,000	\$75,000 for each of the first two years of the project
State Records Board	\$50,000	\$25,000 for each of the first two years of the project
State Agency Partners *	<u>\$60,000</u>	\$30,000 for each of the first two years of the project

Total two year budget	\$303,000
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* Does not include the extensive in-kind contributions that are expected from state and local agency in the form of technical support to integrate their data and systems into Data Sharing Network

16. Provide a detailed description of the budget items listed above. Include:

- An itemized list of hardware and software.
- If new FTE positions are included in the request, please provide a breakdown by position, including separate totals for salary and fringe benefits.
- Provide any on-going operation and replacement costs not included above, including funding source if known.
- Provide a breakdown of all non-state funding sources and funds provided per source.

Hardware and Software

At least one high-end server will be required to support the ArcGIS Server, the exact specifications will be deferred until the GIS Technical Lead/Project Manager is available to provide input.

It is currently estimated that at least in the early stages of this project the existing OCIO SQL Server and storage capacity will be adequate. As the project matures and participation increases, additional storage capacity may be needed.

An enterprise license for ESRI ArcGIS Server 9.2 will be required when the project goes into production mode. During the initial development phase, it is anticipated that we will be able to utilize the UNL ESRI site license for this software at a minimal cost.

New FTEs

At this point no new FTEs are planned for the initial two-year implementation phase of this project. The equivalent of one new FTE, for two-years, will be secured under an interagency agreement between the Office of the CIO and UNL-CALMIT to provide technical leadership and support to this project. Because individuals with the skills required for this project are not widely available, the estimated costs for this position are somewhat high. Likely, because of the relative scarcity of these skill sets, it was felt necessary to secure funding for at least two years to be able to attach an individual with these skills to the position. As part of this project design, during the initial two-year implementation phase an assessment will be made of the types of resources that will be necessary to sustain the project on an on-going basis. As part of that process, an assessment will also be made regarding the possible requirement for new FTEs to support the project.

Replacement Costs

The major replacement and/or maintenance costs associated with this project will be a need to periodically acquire an updated high-end server to support the ArcGIS Server and the need to maintain the annual license fee for ArcGIS Server.

Non-State Funding

At this point, a \$43,000 grant has been secured from the US Geological Survey to support hardware and software costs related to this project. As additional non-state sources become potentially available they will be pursued.

The most significant source of non-state funding will likely be in the form of in-kind services in the form of geospatial data and technical support provide by local and regional public entities such as Omaha/Douglas County, Lincoln/Lancaster County, Sarpy County and local NRDs.

17. Please indicate where the funding requested for this project can be found in the agency budget request, including program numbers.

NA

APPENDIX

Appendix 1 - Draft Position Description for Project Manager

Responsibilities

- Provide technical leadership for building the **Nebraska Geospatial Data Sharing and Web Services Network**
- Manage and maintain ArcIMS servers and software. Utilize ArcIMS to develop online map applications. Utilize ArcGIS for managing data for publication in ArcIMS map services
- Manage and maintain ArcSDE and SQL Server servers and software. Perform data loading and maintenance. Perform regular backups of database
- Write, test, and document Java web applications to enhance or modify online capabilities of SCO and AGIC. Manage and maintain MYSQL RDBMS in conjunction with Java web applications.
- Provide support to Nebraska GIS Steering Committee functions and activities
- Assist in developing and maintaining statewide geospatial data and databases
- Customer service and outreach to the statewide GIS community for cooperative data & GIS development projects as needed

Qualifications:

Master's degree in an appropriate field with a minimum of two years experience working with ArcGIS and one year experience working with ArcIMS, ArcSDE. Experience with web scripting and markup languages (HTML, CSS, JavaScript). Experience with one or more RDBMS packages (Oracle, SQL Server, MySQL, PostgreSQL), ArcObjects programming, geodatabase design and Object Oriented language (Java, C++, C#, Visual Basic) are helpful. Current legal ability to work in the United States and current residency in the United States is required.

Additional skills preferred:

- Knowledge of other GIS software such as ERDAS Imagine or Intergraph
- Experience in implementing FGDC and ISO metadata standards
- Working knowledge of Open GIS Consortium standards and initiatives
- Competence in SQL scripting