BUSINESS PLAN FOR DEVELOPMENT AND DEPLOYMENT OF IDAHO'S SPATIAL DATA INFRASTRUCTURE

Version 1.1

Prepared by:

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1. SDI PLANNING PROJECT BACKGROUND AND STRATEGIC PLANNING SUMMARY

1.1 PROJECT BACKGROUND AND PURPOSE

In February 2008, the State of Idaho was awarded a Category 3 Federal Geographic Data Committee (FGDC) Cooperative Assistance Grant (CAP) for "Strategic and Business Plan Development in Support of the National Spatial Data Infrastructure (NSDI) Future Directions Fifty States Initiative." This grant is intended to assist states in the development and implementation of strategic and business plans to facilitate the coordination of programs, policies, technologies, and resources. Planning work under this grant program began in March 2008. The project is being managed by the Idaho Geospatial Office (IGO) which is part of the State's Office of the Chief Information Officer (CIO).

This work is being carried out within a national context and adopts the principles defined as part of the NSDI. It follows guidelines and a planning approach espoused by the "50 States Initiative" (www.nsgic.org/hottopics/fifty_states.cfm), organized as a partnership between the Federal Geographic Data Committee (FGDC) and the National States Geographic Information Council (NSGIC). Each state realizes its spatial data infrastructure (SDI) which fits into the national map and the National Spatial Data Infrastructure (NSDI).

Spatial Data Infrastructure (SDI) Definition (from OMB Circular A-16):

The technology, policies, standards, human resources, and related activities necessary to acquire, process, distribute, use, maintain, and preserve spatial data.

The main goal of the SDI is to improve statewide coordination and access to geographic data and services to support the business needs of Idaho stakeholders by building on existing geographic information system (GIS) capabilities and spatial data development in Idaho. The main objectives of this project are to prepare a strategic plan and a business plan to guide full development and deployment of the Idaho SDI. From its outset, this SDI planning effort has maintained a *statewide* perspective with a focus on the needs and coordination of all Idaho stakeholders.

This *Business Plan* is a companion document to the *Strategic Plan for Development and Deployment of Idaho's Spatial Data Infrastructure*, completed in October, 2008 which may be accessed from the link: http://gis.idaho.gov/gio/stratplan.htm. This *Business Plan* includes a brief summary of key parts of the *Strategic Plan* but readers are encouraged to review the full *Strategic Plan*.

1.2 PROJECT PARTICIPANTS AND PLANNING APPROACH

The planning project is being managed by Idaho's Geospatial Office (IGO), and the state's Geospatial Information Officer (GIO) is the project manager. An Executive Steering Committee (ESC) with representatives from state and local government has been

assembled to support project management and Idaho's Geospatial Committee (IGC) is acting as an oversight body. The members of the ESC include:

- Gail M. Ewart, Idaho GIO, Idaho Geospatial Office (ESC Chair)
- Anne Kawalec, Ada County
- Jacob Mundt, Ada County
- Nick Nydegger, Idaho Military Division
- Tony Morse, Idaho Department of Water Resources
- Scott Van Hoff, U.S. Geological Survey, Idaho Liaison

The firm of Croswell-Schulte IT Consultants has been engaged to assist in the project. The scope includes participation and input from a broad geospatial community in all types of organizations throughout the state.

This project follows accepted strategic and business planning methodologies and the planning templates and support materials developed by the FGDC and NSGIC as part of the "50 States Initiative" (see www.fgdc.gov/policyandplanning/50states). The approach includes the key activities of information gathering, research, plan preparation and review, executive summary, and plan presentation. The project scope includes the following main phases:

- Phase 1: Project Orientation and Planning Meeting, General Project Set up and Management
- Phase 2: Regional Stakeholder Meetings, Information Gathering and Compilation
- Phase 3: Strategic Plan Preparation and Presentation
- Phase 4: Business Plan Preparation and Presentation
- Phase 5: Executive Summary Preparation

A critical part of the planning process has included contact with and information gathering from a wide spectrum of Idaho's geospatial user community, including all levels of government, the private sector, tribal governments, non-profit organizations, and the academic community. Communication with these groups has been conducted using a variety of approaches including:

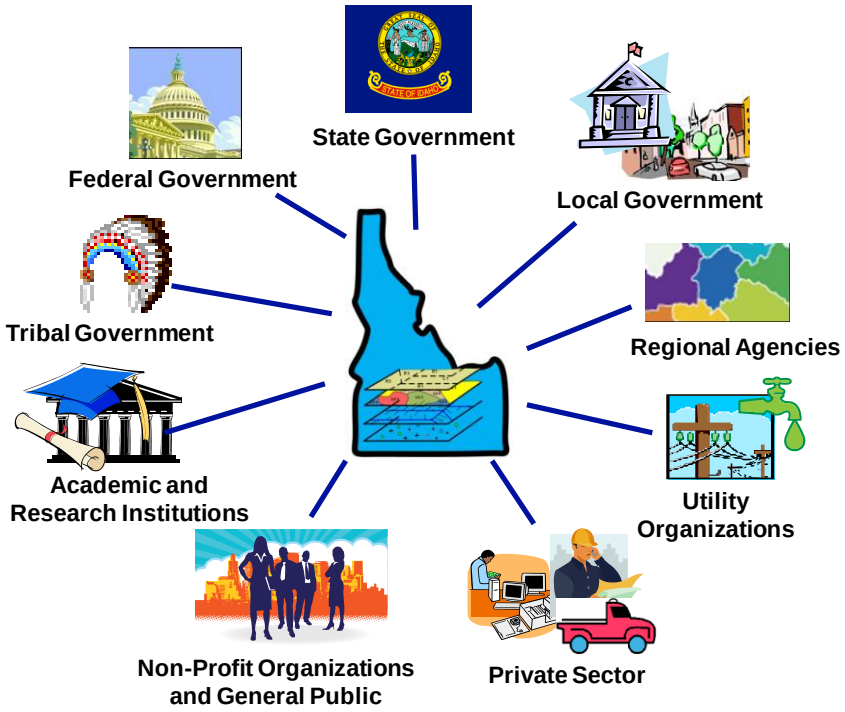
- Ongoing contact through the state's Geotech listserv managed by the Idaho Geospatial Office
- Six regional stakeholder meetings—facilitated sessions that included over 110 people representing the full range of stakeholder organizations
- Meetings with senior officials (state and local government agencies) to gather ideas about long-term direction, business needs, and financing SDI development
- A custom survey gathering information on GIS status, applications, limitations, benefits, and ideas for future development
- Ongoing exchange of information via telephone and email communications

- Participation and outreach at meetings of key professional associations and industry groups including Idaho Association of Assessors, Idaho Society of Professional Land Surveyors, and the Idaho Geospatial Forum

1.3 CURRENT GIS AND SDI COORDINATION STATUS IN IDAHO

GIS technology has been used in Idaho for the past 30 years. Use began in state government with the creation, in 1978, of the Idaho Image Analysis Facility in Idaho Department of Water Resources (IDWR). The IDWR became an active user of GIS and remote sensing technology, and in the late 1980s and early 1990s, other state agencies including the Department of Lands, Department of Environmental Quality, Department of Fish and Game, and the State Tax Commission gradually adopted GIS technology. Since the early 1990s, GIS technology has become an important tool used by a wide range of state agencies. Also during this period, GIS technology became popular with local governments, utilities, and many other public- and private-sector organizations. As illustrated in Figure 2, the current Idaho geospatial user community encompasses a wide range of stakeholder groups reflecting the importance of geospatial information. More information about the history and current status of GIS technology implementation and use in Idaho is provided in the Strategic Plan.

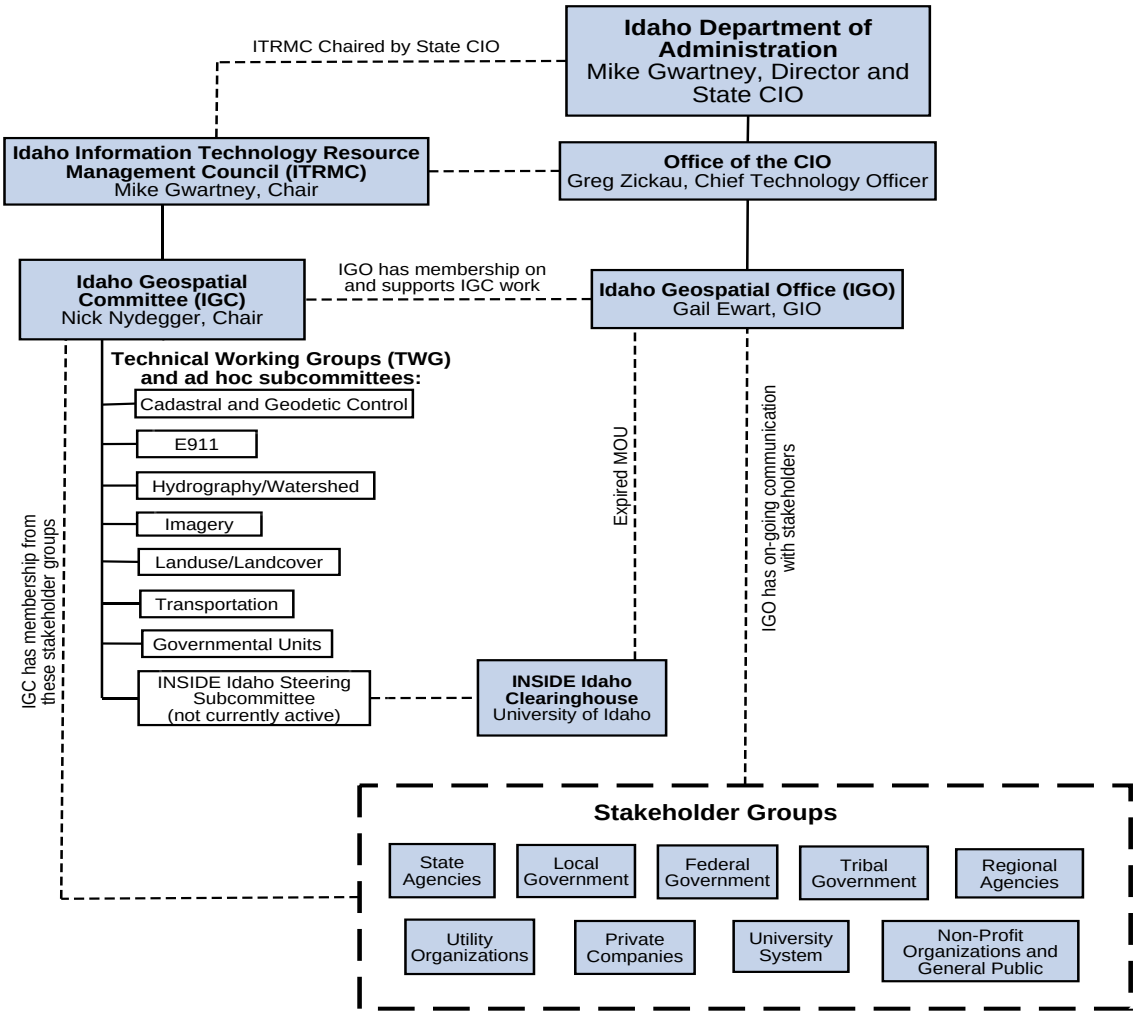
Figure 1: The Idaho Geospatial User Community



Idaho's current GIS coordination structure is empowered through a 2006 Executive Order (EO 2006-05) which was approved to continue the geospatial coordination structure established previously in a 2001 Executive Order. The current management and coordination structure is shown in Figure 2. Ongoing management and coordination

resides in the Idaho Geospatial Office (IGO) led by the Geospatial Information Officer (GIO). The IGO supports and coordinates efforts with the IGC and with GIS personnel in state agencies. In addition, the IGO engages GIS professionals beyond state government across the state. The IGC's mission is to "provide a forum for the GIS community to facilitate the use, development, sharing and management of geospatial data; and to communicate the value of geospatial information to citizens and decision-makers." Its bylaws call for a maximum of 16 members, including representation from state government, tribal government, local government, the private sector, and the state University system. In addition, IGC includes a federal GIS liaison from the U.S. Geological Survey.

Figure 2: Current Organizational Structure for the Idaho SDI Program



The Strategic Plan contains a detailed summary of the history of GIS use and statewide coordination in Idaho. The assessment of needs and status of GIS conducted as part of this project shows a strong and growing interest in GIS technology adoption and deployment coupled with ongoing efforts toward collaboration and sharing of resources. While there is considerable work to be done to build an effective statewide SDI program, the solid user

community, existing investments in GIS technology, and support for improved collaboration set a firm foundation.

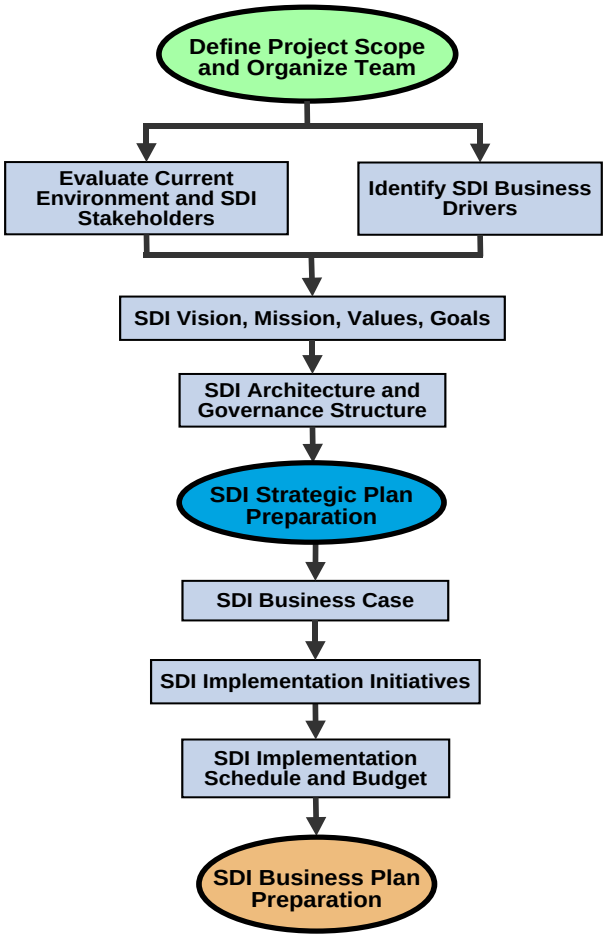
1.4 BUSINESS PLAN OVERVIEW AND STRATEGIC CONTEXT

This Business Plan includes the major sections summarized below:

- Section 1, **SDI Planning Project Background and Strategic Planning Summary**, gives an overview of the SDI planning project, status of SDI activities, and contains excerpts of key parts of the *Strategic Plan*.
- Section 2, **Overview of SDI Architecture**, describes the SDI and includes an overview of the proposed technical architecture and governance structure as presented in the *Strategic Plan*.
- Section 3, **Benefits and Business Justification for SDI Program**, identifies business drivers for SDI and projected benefits and makes a strong business case for proceeding with implementation to accomplish the SDI strategic goals.
- Section 4, **Implementation Initiatives, Timing, and Resource Requirements**, lays out a path for development by presenting specific implementation activities with a projection of resources and timing requirements.
- Section 5, **Implementation Management and Monitoring**, describes roles and responsibility for SDI implementation, an approach for implementation monitoring and management, and SDI program outreach.

Figure 3 depicts the planning process, including elements of the strategic and business planning work. It is based on an evaluation of the current environment and the business drivers for the SDI. Needs are examined along with an identification of current gaps and limitations. This is followed by the development of a vision and mission for the future SDI, and the values and guiding principles upon which SDI development and operation are based. High-level goals, which address the various technical, organizational, and financial areas for SDI development, are then prepared. The Strategic Plan culminates in the definition of implementation initiatives which explain specific areas of work to accomplish the stated goals. The Strategic Plan encompasses goals and implementation activities for completion in a five-year period, beginning in January 2009.

Figure 3: Overview of Strategic and Business Planning Flow



1.5 STRATEGIC FOUNDATION

As previously defined, the SDI is "the technology, policies, standards, human resources, and related activities necessary to acquire, process, distribute, use, maintain, and preserve spatial data." The National States Geographic Information Council (NSGIC) describes the purpose of the SDI, "to provide accurate and reliable data for decisions regarding the security, health and welfare, and prosperity of our citizens." A main part of the Strategic Plan is the establishment of a strategic foundation for the SDI program. It includes a vision, mission, and high-level goals that set the overall direction for SDI development over the next five years. In keeping with ITRMC's enterprise concept, a strategic foundation is defined as it relates to long-term business needs for geospatial data and technology tools. Idaho's SDI vision and mission statements presented below have been prepared with input from the project Executive Steering Committee (ESC) and stakeholders around the state. The key aspects of this strategic foundation include an SDI vision, mission, and high-level goals that create a context for specific implementation activities. Idaho's SDI vision, mission, and goals are stated in the following.

Vision:

Idaho's Spatial Data Infrastructure (SDI) is fully developed, maintained, and managed and supports the missions of Idaho organizations through easy access to high-quality geographic information and related services.

Mission:

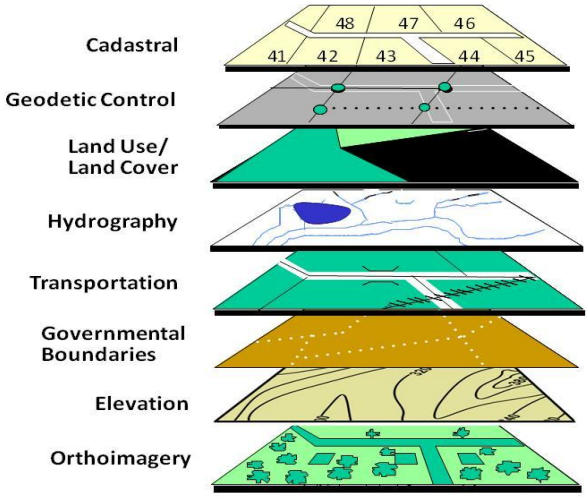
With leadership by state government and active participation from stakeholders statewide, we will develop, deploy and efficiently operate the SDI with a focus on meeting the geographic information needs of users and delivering real, substantial benefits to a comprehensive spectrum of organizations and individuals in Idaho.

High-Level Goals:

1. Develop a strong business justification to cultivate high-level support and sustained financing for the SDI.
2. Implement an improved SDI management coordination structure with appropriate legislation, policies, and management practices that supports full SDI development and its ongoing operation and which promotes statewide participation and collaboration
3. Define standards for and complete development of Framework data, and establish tools and procedures for perpetual data maintenance and appropriate access.
4. Leverage emerging technologies to enhance access and use of SDI data and services.
5. Connect and integrate state and local/regional activities by establishing region-based resources that provide practical help, enable professional networking, disseminate best practices and act as a consistent, multi-directional channel of communication.
6. Increase awareness of and support for the SDI program and its benefits.
7. Encourage, provide guidance, and help establish financial support for development and maintenance of non-Framework geographic data that enhance organizations' use of and benefits from GIS technology.
8. Expand the awareness of the GIS technology and integration of geographic information in organizations, disciplines, and applications in which GIS use is not common but where substantial benefits may be achieved.
9. Maintain current knowledge about GIS and information technology trends and industry offerings to take advantage of new products, tools, and practices.

1.6 GEOGRAPHIC DATA DEVELOPMENT STATUS AND USE

SDI success is dependent on high-quality, statewide geospatial data which is well-maintained and adheres to acceptable content and format standards to support effective use and sharing. SDI development has a central focus on Framework data themes—spatial data that is commonly needed by a wide spectrum of GIS users with a goal toward developing and maintaining coverage statewide. Currently accepted Idaho Framework themes include the following:



The Idaho Geospatial Office (IGO), based on input from stakeholders, has proposed additional themes for acceptance as Framework, including Bioscience, Geoscience (soils, geology), Climate, Public Safety, Utilities (pipelines, broadband communications), and Hazards. Most Framework themes include multiple datasets relating to the theme. For example, Transportation includes roads, rails, trails and ports. For more information about the details of Framework content, visit the Idaho GIS community website at http://gis.idaho.gov/framework.htm.

Statewide coordination of Framework is managed through Technical Working Groups (TWGs) established under the IGC. There are six established TWGs (Cadastral and Geodetic Control, E911, Hydrography/Watershed, Landuse/Landcover, Imagery, Transportation) and one additional TWG, Governmental Units, is being organized. Also, the current E911 TWG is being reorganized as the Public Safety/Preparedness TWG. See www2.state.id.us/itrmc/committees/igc/twgs.htm and http://gis.idaho.gov for more detailed information. There has been significant progress in Framework database development in Idaho, but much work remains to reach the ultimate objective of statewide coverage and sound ongoing stewardship.

1.7 CURRENT LIMITATIONS AND OBSTACLES TO BE ADDRESSED IN SDI PLANNING AND DEVELOPMENT

An evaluation of the status of SDI development, current GIS use, and the needs of stakeholders statewide has revealed a number of important limitations and obstacles that inhibit SDI development and which prevent users from achieving the full range of potential benefits from GIS technology and statewide geographic information sharing. These obstacles and limitations, which are explained in more detail in the Strategic Plan, create a starting point for planning—to ensure that strategic goals and implementation initiatives focus on the critical areas that will contribute to SDI success.

Obstacles and limitations impact a number of critical areas including: a) organizational and management structure and practices, b) data development or management, c) system configuration, software, or application development and operation, d) education, outreach,

and internal/external communications, e) funding, budgeting, and financial management, and, f) legal or policy development. Some of the more critical limitations and obstacles cited by stakeholders have to do with the lack of a clearly articulated business case and cost justification and how this inhibits high-level support and allocation of funds for SDI initiatives. The lack of a consistent statewide GIS database is identified by many as a major problem that inhibits deployment of IS and sharing of data at a regional and statewide level. The geographic distribution of users and statewide disparity among jurisdictions in availability of resources for GIS development is a major factor that impacts SDI development. Other organizational, technical, and operational limitations have been identified which will be addressed through this plan.

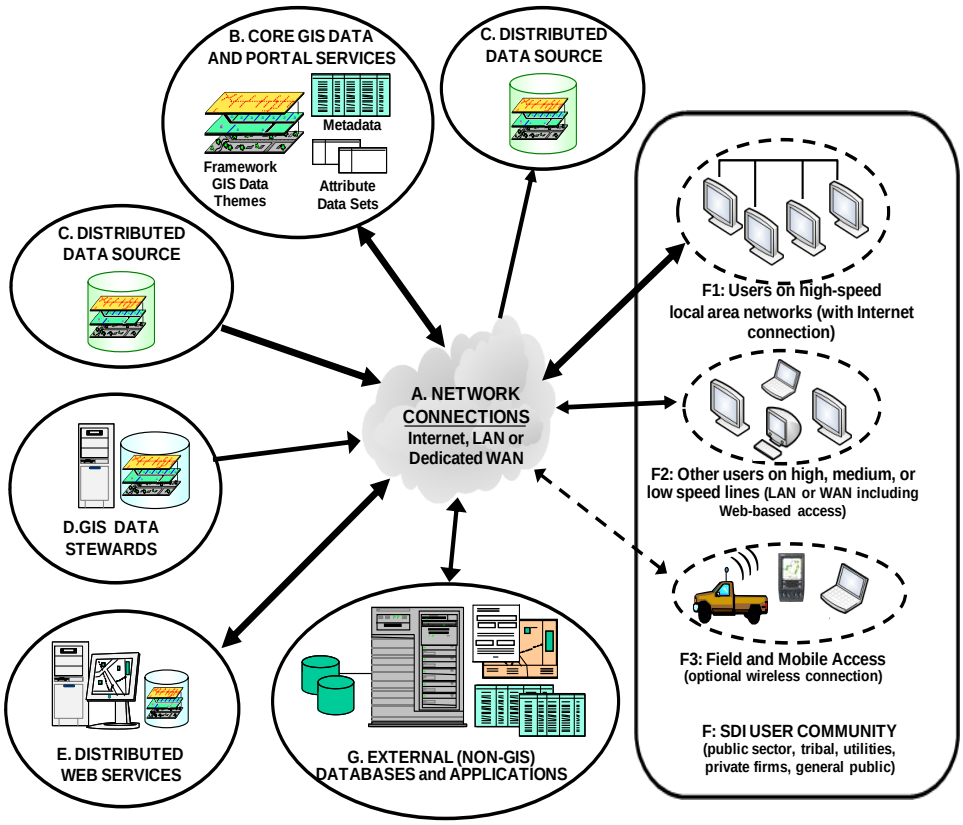
2. OVERVIEW OF SDI ARCHITECTURE

2.1 OVERVIEW OF SDI TECHNICAL SYSTEM ARCHITECTURE

The overall system architecture for support of Idaho's SDI consists of the components illustrated in Figure 4. This figure represents a conceptual technical configuration for full deployment by the end of the five-year timeframe of this plan. It shows, at a high level, the main system, database, and network connections that would be needed to support SDI users. This figure gives a general depiction the main components of the SDI architecture and is not intended to be used as a physical configuration design. Its purpose is to provide a general concept to guide long-term SDI development.

Note: The SDI architecture shows a number of key components that convey a range of roles and services. In practice, the architecture will follow a system model with a mix of distributed and centralized services for data management and GIS application services for users throughout the state. This can generally be described as a virtual environment, using increasingly robust communication links and web services to allow user access without the need for a highly centralized system configuration. The technical details and designated roles for specific sites will be defined as part of SDI development.

Figure 4: Idaho SDI Conceptual Technical Architecture



The main parts of the SDI technical architecture are described in Table 1.

Table 1: Conceptual SDI Technical Architecture—Main Services and Roles

A: Network Connections	This "virtual component" conveys the idea that the SDI will make use of all available network links available to users. This includes access by existing dedicated local and wide area communications (e.g., state government and local government networks) and all other services allowing Internet communications for users inside and outside the state.
B. Core GIS Data and Portal Services	SDI data and services will be organized and made accessible to users statewide at multiple sites that have a designated role for providing data and services. They will include storage of selected data for direct access, metadata and links that support search and evaluation of data, some core Web-based applications, links to distributed data sources, and other information useful to the statewide SDI community. The sites serve as repositories for all or most Framework data and will coordinate closely with data stewards for accepting and consolidating updates. Sound policies and procedures for data and service administration and maintenance will be put in place.
C. Distributed Data Sources	These will be sites at different locations around the state with the computer hardware, software, and system administration resources to support GIS data management and access. These sites include selected GIS clearinghouses that are already in place or may be created in the future to support management and access of data for specific geographic areas (e.g., county jurisdiction) or a particular subject area or discipline. Some of these sites may serve a back-up role for the Core GIS Data and Services (B) to establish some fault tolerance for continuity of SDI services. These sites may also play a Data Steward (D) role.
D. GIS Data Steward Sites	Designated stewards, those organizations that have a lead responsibility for collecting, creating, and updating data, will perform the majority of Framework and non-Framework data update and maintenance. This includes multiple federal and state agencies, local governments, utility companies, and other participants. For some themes, data may be uploaded to the Core GIS Data and Services Sites (B) for hosting, but the stewards will manage other data sets with access provided at their sites. These sites may also play roles as Distributed Data Sources (C) and/or Distributed Web-based GIS Services (E).
E. Distributed Web-based GIS Services	Distributed Web sites providing a range of GIS services will be accessible by SDI participants. These may include Web-based applications provided by government agencies (state or local), the private sector (e.g., Google Earth), or other sites providing geographic query, viewing, analysis, and other applications. In some cases these sites may be the same as, or integrated with, Distributed Data Source sites (C) but they may include any site providing Web-based applications (not necessarily a formal part of Idaho's SDI program) but accessible to users to augment other sources of GIS applications.
F. SDI User Community	The broad user community includes any public sector or non-public sector organization or member of the public that uses any SDI data or services.
F1. Users on High-speed Network	This group of users includes office-based personnel who connect to a local server and to the Internet through a high-speed local area network.
F2. Other LAN or WAN Users	Includes all participating, public sector organizations (federal, tribal, regional agencies, special districts, local governments, and public universities, private companies, general public). These users will access SDI data and services using available wired communication services.
F3. Wireless Access	As the technology matures, expanded support will be developed for field and mobile data access through wireless data communications from vehicle-based computers or portable/hand-held devices. Field and mobile access may include "disconnected" GIS use or wireless communications as wireless data services are made available to specific geographic areas.
G. External Databases and Applications	Access will be provided to and from non-GIS databases and applications that require geographically referenced data or specific services to geographically enable those external systems. The nature of the access may range from data download to more interactive data and application integration.

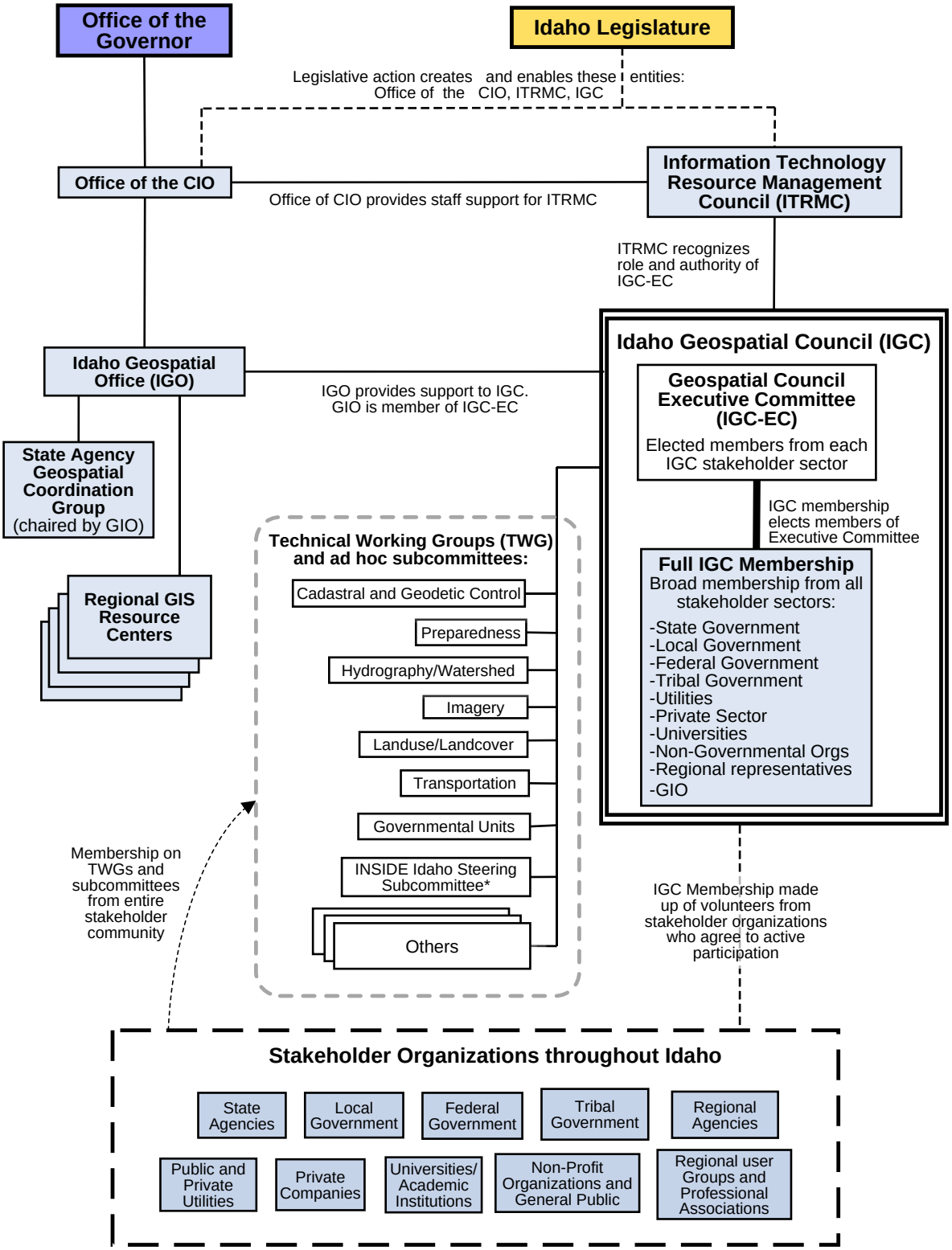
2.2 SDI GOVERNANCE STRUCTURE AND MANAGEMENT

The proposed SDI governance structure addresses all the critical organizational and management concerns important for statewide coordination and operation including: a) enabling legal/policy action, b) GIS oversight authority, c) SDI management, d) coordination bodies, and e) formal policies and rules for SDI operation. Idaho's future SDI governance structure must meet the following organizational and management challenges:

- Clear oversight roles with adequate authority to approve SDI standards and policies and make resource decisions that support SDI goals
- Maintaining understanding and support from senior elected and executive officials
- Routine coordination and liaison with GIS users throughout the state and establishing formal partnerships for project activities and expanded use and access to geographic information and services
- Maintaining coordination of SDI activities of state agencies as a distinct, critical SDI stakeholder group.
- Understanding the importance of regional groups for mutual GIS program support, and finding practical ways to establish a regional presence as part of the statewide SDI program
- Securing and sustaining adequate funding, from multiple sources in support of SDI development and operation
- Preparing, approving, and overseeing formal standards and policies for SDI development and operation
- Coordinating the work of stakeholder organizations, contractors, and data suppliers to accelerate Framework database development
- Expanding access to GIS technology and geographic data
- Addressing requirements for communication and education at all levels to promote wide use of GIS and technical support to users.

The SDI governance structure is designed to integrate smoothly with state government IT governance and management while strengthening coordination and collaboration with all stakeholder groups and users statewide. This governance structure adapts organizational elements currently in place and includes some new and revised elements that better respond to SDI coordination and support needs. Figure 5 depicts this proposed structure, and Table 2 explains the main components.

Figure 5: Proposed Future Governance Structure for Idaho's SDI



*INSIDE Idaho services enhanced to play Core GIS Data and Services site with stable funding, expanded capabilities, and primary coordination role for "virtual geospatial portal" support.

Table 2: Explanation of the Main Organizational Components of the SDI Governance Structure

Information Technology Resource Management Council (ITRMC)	The ITRMC maintains its current status as an IT coordination, policy, and standards body with its legislative mandate. Staff support from the newly re-established Office of the CIO continues. Acting on recommendations by the Office of Policy Evaluation and the IT Alignment Committee, the ITRMC's authority and oversight activities are enhanced.
Office of the CIO	The Office of the CIO is moved, through legislative action, to the Governor's Office. In this organizational shift, it continues its role as staff to the ITRMC and increases its role and activity in IT planning and oversight, IT coordination for state agencies, development, oversight, and operation of enterprise shared systems. It continues to be the parent body for the Idaho Geospatial Office.
Idaho Geospatial Office (IGO)	The IGO maintains its role as the main management body for GIS and the SDI program. Its authority is expanded through the organizational move to the Governor's Office. Staff is expanded somewhat to respond to increased requirements for SDI coordination and operational support and administration. The IGO is led by a Geospatial Information Officer (GIO).
Idaho Geospatial Council (IGC)	The IGC is new body that will be a restructuring of the current Idaho Geospatial Committee. This is a large group made up of volunteers acting as representatives of different stakeholder sectors (constituent groups). This organizational approach has been successful in several states to meet the need to broaden SDI involvement to a wider group of stakeholders. The main purpose of this body is to represent the needs and ideas of the broad statewide SDI community and to serve in an advisory role to the IGO, ITRMC, the Office of the CIO, and other decision makers. Ideally, the IGC is formally recognized by the legislature. Bylaws are created which establish operating rules and requirements for members. The GIO is a member, but the Chair position rotates based on voting by members and any member of the IGC may be elected to the Chair role. Membership size is not limited.
Idaho Geospatial Council Executive Committee (IGC-EC)	The Executive Committee of the Geospatial Council is formally created and recognized by the ITRMC. It formally governs the IGC and takes formal actions on SDI related policies, standards, resolutions, and recommendations for senior management. Members of the EC are voted on by the full membership of the IGC and the leader of this body is the Chair of the IGC. There are approximately 12 members that include representatives from all stakeholder sectors, the IGO, shared services locations, and regional centers.
Technical Working Groups (TWG) and Subcommittees	Technical Working Groups and Subcommittees are established as required by the IGC-EC. They operate in a manner similar to the current organizational structure. TWGs have a specific mission, leadership, membership and timeframe and are formally dissolved after their mission is completed. Subcommittees are more long-term and fulfill roles that have an ongoing need without necessarily a fixed work plan or timeframe.
State Agency Geospatial Coordination Group	A separate group organized administratively by the Office of the CIO and led by the IGO. Its purpose is to address SDI and GIS technology issues of direct interest and importance to state agencies and to facilitate communication, coordination, sharing of resources, development and adoption of standards, joint project work, in support of SDI goals and overall efficiency of GIS operations and resource usage. It includes membership from all state agency geospatial technology and data users and is chaired by the GIO.
Regional GIS Resource Centers	These Centers act as points of coalescence for GIS user organizations in different areas of the state and help to connect local activities with the statewide SDI program. They will be supported by existing institutions or groups (e.g., universities, existing regional GIS user groups). Depending on regional needs, they may provide services and support functions, such as: a) answering technical questions for users, b) providing some general "consulting" support and advisory services for organizations in the process of GIS development, c) training sessions, d) site for meetings and special SDI events, and e) aggregate and serve regional Framework data. These centers can be established and put in operation over a period of time as they are needed and as resources permit. The coordination and support now provided by regional GIS user groups will be a foundation for Resource Center development.

2.3 OPERATIONAL POLICIES AND PRACTICES

Formally defined policies and "best practices" will guide all aspects of SDI development, operations, and coordination among stakeholders. These should be consistent with, and expand on where necessary, existing information technology and organizational management policies and practices of stakeholder organizations. For the SDI, a clear, accessible set of policies will promote statewide coordination and sharing of data and resources. SDI development will include initiatives that will gather and enhance existing policies and practices and develop new ones in the following areas:

- Enterprise system architecture and administration
- Compliance with technical standards
- GIS data quality and maintenance
- Access to GIS and use of GIS data
- GIS product/service procurements
- GIS integration with external systems
- Legal and administrative rules and procedures impacting access and distribution of GIS data and products
- Technical support to GIS users
- GIS staffing and professional development
- GIS project set up and management

3. BENEFITS AND BUSINESS JUSTIFICATION FOR SDI PROGRAM

3.1 SDI BUSINESS CASE PREMISE

Public agencies, private firms, and non-governmental organizations in Idaho depend on maps and geographically referenced information to support day-to-day operations and long-term planning and decision-making. In fact, at least 80 percent of the information collected and managed by governmental bodies, utility organizations, and many private companies is geographic in nature. That is, the majority of the information they compile and use has some locational key such as address, road segment, facility location, map coordinate, or an area identifier. Despite substantial, ongoing investments in geographic information and GIS technology in Idaho, users and potential users continue to experience insufficient access to important geographic information and the technology to use it effectively. For a wide range of programs and projects, staff and program managers spend a considerable amount of time just gathering or assembling information from a wide range of sources. Despite considerable progress and improvements in the deployment and use of GIS technology, geographic information is still often hard to find, access, and integrate in a manner that makes it useful to those who need it, when they need it. The SDI will leverage existing resources and systems and greatly enhance access to technology tools and data to deliver expanded benefits.

The problem in access to data and technology is rooted largely in policy and organizational procedures and not, as often assumed, in technical obstacles. Administrative barriers, poorly defined management authority, problems in allocating available funding and finding new sources, and inadequate management controls have resulted in missed opportunities, duplication of resources, and inconsistencies in data format and quality.

In summary, Idaho's SDI will:

- Address important business needs of a large, statewide community of users
- Deliver substantial financial and non-financial benefits in the short-term and long-term
- Build and capitalize on existing networks, systems, and geographic data investments to establish a robust, sustainable system and database architecture
- Put in place more effective management and improved leveraging of state, federal, and local sources of funding for geographic information data and technology
- Create an environment that encourages effective, mutually beneficial collaboration and partnerships

The resources and organizational structure that is proposed for an improved SDI will make a meaningful impact on the state in the following ways:

- Avoid redundant costs of geospatial data development and access by state, regional, and local government agencies
- Encourage inter-agency and inter-organizational coordination and integration of resources, including collaboration among federal, tribal, state, regional, and local organizations
- Improve operational efficiency to cut costs and reduce response time in a wide range of geographically related business processes
- Support analysis and planning to reduce energy consumption and the statewide waste stream
- Increase access to GIS technology and information statewide including an emphasis on rural areas where resources and communications are limited
- Improve opportunities for business development at the local level, and increase the state's competitiveness and position in major economic development initiatives of statewide significance
- Support effective emergency planning and operations and the ability and efficiency of state and local response to emergencies, with a resulting savings of life and property
- Enable better planning and more efficient provision of citizen services in the public health, education, housing, and employment support areas
- Provide a more efficient and cost-effective means for managing, maintaining, and tracking the state's public infrastructure and assets—roads, utilities, public land, and all public real property
- Manage the state's environmental quality and natural resources to sustain economic viability, enhance tourism, and to provide a resource to improve the quality of life for Idaho's citizens
- Improved quality of and confidence in geographic data which supports more efficient operations and effective decision making

3.2 PAST AND ONGOING INVESTMENTS IN GEOSPATIAL TECHNOLOGY IN IDAHO

3.2.1 State and Local Government Investments

During the more than 20-year history of GIS implementation and use in Idaho, state and local government agencies have invested huge sums of money in geospatial data, system infrastructure, staff, consulting services, and support (e.g., training, materials, maintenance). Based on information gathered from the main users of GIS technology in state government (Idaho Dept. of Water Resources, Department of Environmental Quality, Military Division, Department of Lands, Transportation Department, and the Geological

Survey), state agencies invest over $2.5 million annually in their GIS programs and over the last five years, the total GIS investments are conservatively estimated at about $14.5 million. Over 50% of these investments have gone to personnel and contract costs for GIS database development and maintenance. A significant amount has also been spent on GIS technical and management personnel, GIS software, and computer hardware. The figures above only reflect the amount spent by the six state agencies as part of their formal mapping or GIS programs and does not include other agency GIS expenditures or money spent in the use of GIS under programs and budget items not specifically identified as GIS-related. The actual investment in GIS development and operations by state government in the last five years, if it could be fully measured, would likely show an amount over $18 million. These investments have delivered real benefits. GIS use at the state government level is climbing, and significant sums will continue to be spent in the future. It is recognized that more value can be derived from these investments through a more effective statewide SDI program.

Local governments are active users of GIS technology and, like state government agencies, have invested significant amounts of money in GIS data, systems, and services. GIS expenditure information was gathered from a sample of small, medium, and large cities and counties among the growing number of local governments that have implemented, or are in the process of implementing, GIS programs. The sample counties, with population figures shown, include Ada (333,000), Bonneville (90,000), Bonner (40,000), Boundary (11,000), Clearwater (8,500), Nez Perce (38,000), and Teton (7,500). Together, these counties spend about $3.5 million annually on their GIS programs. Over a five-year period, almost $17 million has been invested in GIS from these county government GIS programs. Among selected cities (with population shown) including Boise (192,000), Coeur D'Alene (39,000), McCall (2,400), Nampa (69,000), and Post Falls (22,000) the GIS investments total about $1.75 million annually and almost $6.5 million over the last five years. This sample of cities and counties gives a picture into the current and potential future investments in GIS. At least half of the counties in Idaho currently have GIS programs and others are planning to deploy GIS. Most of Idaho's 19 cities with a population of 10,000 or more currently have GIS programs, as do a number of smaller cities. Interest in GIS is growing and annual investments statewide at the local government level likely exceed $10 million annually and this amount will grow in the coming years. The trend in Idaho and throughout the USA is toward increased GIS adoption at the local level—particularly among smaller jurisdictions which are better able to put in place GIS programs with decreases in the cost of implementation.

3.2.2 Federal Government Investments

Multiple federal agencies operating in Idaho are committed users of GIS, and they maintain programs that often support or require coordination with state and local agencies. The fact that over 60% of Idaho's land area is under federal management, underscores the importance of GIS to such agencies as U.S. Forest Service (USFS), U.S. Geological Survey (USGS), Bureau of Land Management (BLM), Bureau of Reclamation (BOR), Natural Resources Conservation Service (NRCS), Farm Service Agency (FSA), the Department of Defense (DoD), and others. Information on GIS expenditures gathered from several of these

agencies (BOR, BLM, USFS, NRCS, and FSA) shows an annual amount of about $9.6 million with a five-year GIS investment of over $26.5 million. A large part of this is for GIS database development and maintenance. If the investments of other federal agencies were fully accounted for, the five-year total would likely be well over $35 million. Federal agencies spend significant sums on an annual basis and will continue to do so in the future. While GIS collaboration between state and federal agencies is quite good in many cases, there is significant room for improvement and for better leveraging of allocated funds to help build Idaho's SDI.

3.2.3 Other Investments in GIS

The general figures presented above on investment in GIS technology and services by local, state, and federal government tell only part of the story on funds that continue to be spent in Idaho. Other SDI stakeholder organizations make heavy use of GIS technology and invest substantial funds in developing databases, implementation systems, and deploying applications that support their programs and business needs. GIS is an important tool used by public and private utilities, for maintaining infrastructure and providing water, electric, gas and telecommunications services to Idaho residents and businesses. Utilities such as Avista, Idaho Power, Intermountain Gas, private water companies, electric cooperatives, public and municipal utility districts, and other utility organizations spend millions of dollars each year on GIS development and operations. Tribal governments, most notably the Coeur D'Alene Tribe, invest significantly in GIS development and operations. Growing private sector use in Idaho by companies that use GIS to support their operations (e.g., land development and management, support for mining and timber operations, commercial services) and an emerging GIS services business sector adds to the overall financial impact of GIS in Idaho.

3.2.4 The Case for Improved Leveraging of GIS Investments

Tens of millions of dollars are spent on GIS development and operation in Idaho on an annual basis, and expenditures are increasing. While these investments are driving effective use of GIS technical and real benefits to users, full value is not being realized because the current environment is characterized by:

- Inadequate coordination and collaboration on GIS initiatives and projects
- Duplication, redundancy, and incompatibility in data and systems
- Insufficient technical and procedural standards that could enable better sharing of data and system resources
- Lack of an organizational structure that helps identify GIS opportunities for increased business value

3.3 SDI BUSINESS FOCUS

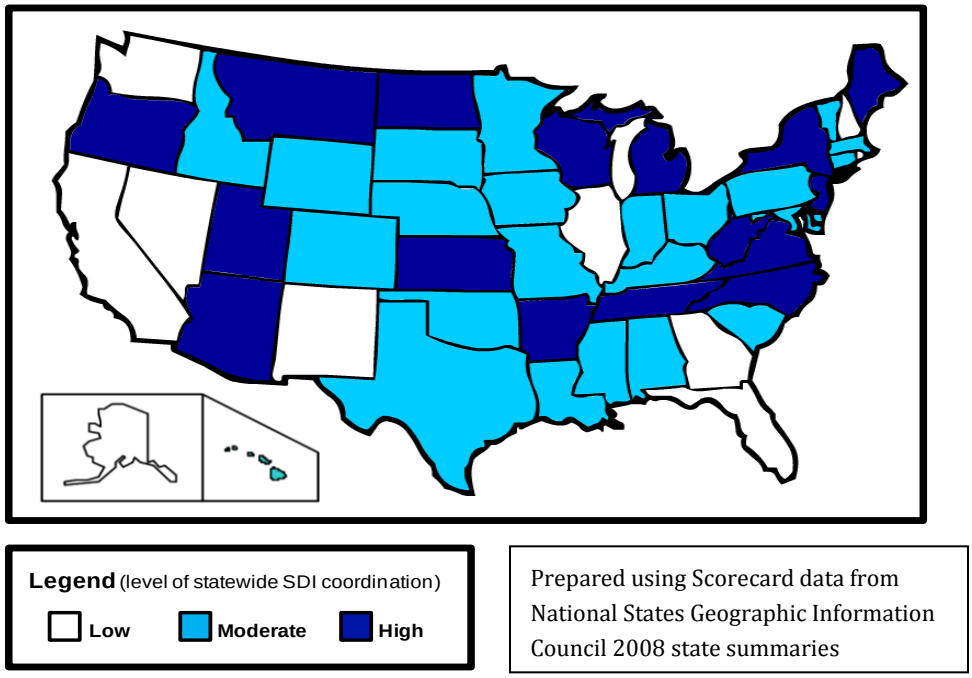
Idaho's SDI will result in an organizational structure, standards, and management practices that encourage collaboration, sharing, and a more effective use and channeling of money and staff resources for GIS activities through the following means:

- Encouraging and enabling joint database development work and the development and deployment of GIS applications, with an overall reduction in cost through coordination in timing and economy of scale
- Reduction in duplication of geographic database development and maintenance with a direct savings in cost
- Lowered costs for GIS software and computer systems through the use of enterprise software licenses, increased use of Web-based services, and targeted consolidation of computer resources
- A more comprehensive set of technical standards that allow for better sharing of data, systems, and applications resulting in reduced operational costs
- Improvements in education, technical support, and technology transfer that increase the effectiveness of staff and the use of GIS technology to help deliver increased value
- An organizational and coordination structure that helps identify new opportunities for applying GIS technology in ways that help reduce costs and increase benefits

3.4 STATUS OF GIS COORDINATION AND EXAMPLES OF BENEFITS IN OTHER STATES

Idaho is among a number of states that have taken serious steps toward GIS coordination in the last decade. At the current time, nearly all 50 states have active GIS programs, the most successful of which serve multiple state agencies and a wide spectrum of non-state government stakeholder groups. While SDI development is challenging, there are precedents in other states that have launched major SDI coordination programs and are reaping substantial benefits. Many states have formal management and coordination structures to oversee statewide GIS operation, and several of them have very active statewide programs which are delivering benefits to a large GIS user community. Figure 6 gives a general view of the status of statewide GIS programs throughout the USA.

Figure 6: Overview of Statewide GIS Coordination and Activity



Utah, Montana, Oregon, Arkansas, North Carolina, Wisconsin, for example have made substantial progress in accomplishing many of the same goals identified in Idaho's SDI Strategic Plan, and to a large extent, they serve as examples and models for SDI development in Idaho. Some examples of successful statewide GIS coordination programs that have created an environment for effective implementation and deployment of GIS technology are provided below:

- In **Montana**, the statewide SDI program is managed by the state's Information technology Services Division and statewide coordination is supported by the Montana Land Information Advisory Council (MLIAC), established through legislation. The SDI program has the full support of the Governor's office and senior executives in state agencies and local jurisdictions. The SDI has a well-organized coordination structure, policies and standards, strong enabling legislative and executive mandates. The Governor has issued seven challenges for GIS technology that have a focus on energy resources (wind, hydro, coal, and ethanol), economic development, and environmental management. These challenges set a foundation for active use of GIS technology and ongoing development of geographic data and services. The GIS user community in Montana is large and growing as evidenced by the increase in membership of the Montana Association of Geographic Information Professionals, a non-profit user group with over 300 members. GIS users in the state have received significant benefits from an active Geographic Information Clearinghouse that provides statewide digital map data and on-line tools for query and selection of data of interest to users.
- The GIS program in **Utah** is managed by the Automated Geographic Reference Center (AGRC) administratively located in the state CIO's Office. The AGRC coordinates GIS data access and services for state agencies and a large community of non-state

government organizations. AGRC is established through state legislation, and its role as the authoritative body for geographic information and digital mapping is recognized in multiple state statutes. Statewide coordination, standards development, and promotion of GIS is supported by the GIS Advisory Council and a statewide user group (UGIC) serves as a body for professional networking and facilitation in the use of GIS technology and inter-organizational cooperation. A GIS portal web site facilitates communication among stakeholders statewide and provides access to a rich set of geographic data and services. The state adopted a "Geospatial Infrastructure Strategic Plan" in 2008 which calls for additional enhancements to geospatial data resources, improved, standards-based collaboration and partnerships, and an expended set of geospatial services available to the statewide user community.

- **Arkansas**' statewide geographic information coordination efforts are managed by the Geographic Information Office (AGIO), a division in the state's Department of Information Systems. Statewide coordination is supported by the State Land Information Board (ASLIB) created through state legislation in 1997. Funding for major geographic database development, AGIO operations, and the operation of the state's clearinghouse (GeoStor) which provides an extensive set of geospatial data to users statewide. The AGIO and ASLIB have been successful in forging many successful partnerships and GIS development programs including: a) statewide road centerline (ACF) development with participants at all level of government, b) FEMA partnership for floodplain development, c) statewide orthoimage program (ADOP), and d) County Assessors Mapping Program (CAMP) for statewide cadastral database development. The AGIO has led a series of successful GIS application projects for state agencies and other organizations around the state and is actively pursuing use of GIS to support major initiatives in the areas of public health, emergency management, energy development, infrastructure management, environmental management, and education.
- **North Dakota** has an active state GIS program managed by a GIS Office in the state's Information Technology Department. GIS coordination is supported by the GIS Technical Committee and a State Mapping Advisory Committee. The overall GIS program is enabled both by state legislation and executive orders issued by the Governor's Office. There is active participation by state agencies and a broader GIS community including the state's Association of Counties, League of Cities, 911 Association, and Association of Assessing Officers. To support geographic information sharing and collaboration among, the North Dakota GIS Hub (NDGH) was created. It is a web-based portal, with a well-designed interface, that facilitates direct access to GIS data and provides coordination services for state GIS users.

Statewide SDI programs in other western states and throughout the USA, including Arizona, Oregon, Kansas, Minnesota, North Carolina, and Virginia, have put in place effective statewide geographic information coordination programs and have adopted ambitious plans for improvement and enhancement over the next several years. Idaho has a long, successful history in the deployment and use of GIS technology, and over the last several years, organizations in the state have made significant progress in improving coordination and expansion in GIS technology use. But there is much more that must be done to improve management and coordination to realize the full value of GIS and deliver

enhanced benefits to SDI stakeholders. The foundation laid in Idaho and the examples provided by other states that have met similar challenges creates a firm basis for a greatly improved SDI for Idaho.

3.5 NATIONAL AND STATE ENDORSEMENTS FOR SDI DEVELOPMENT

The SDI concept is based on the premise that geographic information is critical to the operations and long-term health of a wide spectrum of public sector organizations, private companies, non-governmental groups, and the general public. The benefits of an improved environment for joint development and sharing of geographic information is recognized by many prominent national and state organizations. The importance of statewide SDI's is supported through the "50 States Initiative" of the Federal Geographic Data Committee and the National States Geographic Information Council (NSGIC) (see www.nsgic.org/hottopics/fiftystatesinitiativehandout.pdf). In addition, the National Association of State CIOs (NASCIO) has formally endorsed statewide enterprise GIS development through its recent briefing document, Governance of Geospatial Resources: Maximizing the Investment in State Resources (see www.nascio.org/publications/documents/NASCIO-E-RecordsChallenges.pdf).

Many organizations inside the state also recognize the value of an enhanced, coordinated SDI for Idaho. A number of these organizations have provided formal endorsements of this SDI development effort stating strong support for "SDI development goals as articulated by the Idaho Geospatial Committee (IGC) and support long-term development and operation of the state's Spatial Data Infrastructure." These endorsements, on file with the IGO, have been submitted by:

- Association of Idaho Cities (Ken Harward, Executive Director)
- City of Boise Mayor Bieter and Fire Chief Doan
- Idaho Power
- Intermountain Forest Association
- Idaho State University (Office of President Vailas)

These endorsements underscore the broad interest and support for SDI development.

3.6 IDAHO SDI BUSINESS DRIVERS AND BENEFITS

3.6.1 SDI Business Drivers

A GIS business driver is a major need, program, service area, or challenge faced by organizations that may be impacted or supported by GIS technology and data. Business drivers may reflect strategic or operational goals of an organization, user or customer service needs, legal or regulatory mandates, external conditions (economic, social, political) or other business factors. This section presents business drivers that establish a very strong business foundation for SDI development and operation. Business drivers for Idaho's SDI have been identified through input from the statewide geospatial user community.

Some business drivers are high-level in nature, reflecting overall goals or advantages for the organization as whole and impacting multiple departments and user groups. The main overarching business drivers impacting Idaho's SDI program identified in Table 3 with an indication of their priority and key points about benefit opportunities from the SDI.

Table 3: Overarching GIS Business Drivers Impacting Multiple Organizations and Disciplines

Business Driver	Priority*	Opportunities for Idaho's SDI
Basis for inter- and intra-organization coordination and partnerships	VH	GIS is a technology that naturally encourages sharing of information and resources because multiple departments and organizations share similar needs for geographic information. GIS can be used as a basis for effective partnerships, cost sharing, and project collaboration.
Response to public demand for information	VH	The demand and expectations for information from government agencies by businesses, organizations, and the general public is increasing. Much of the required information is geographically based, and GIS technology and data can support efficient response to information requests. GIS gives tools to government employees to give quicker response (permit information, property appraisal questions, jurisdiction and services) by employees and direct access by the public via Web-services.
Reduction in redundancy, labor time, and cost	VH	GIS tools and sound data management can be the basis for a reduction in the duplication and redundancy in data maintenance, thereby reducing costs and labor time in data maintenance. GIS reduces overall labor time for information access, data analysis, research, and information distribution.
Enhanced Revenue	H	With its ability to organize, integrate, map, and analyze geographic data, GIS helps to ensure effective and complete revenue generation from existing sources--tax payments, utility bills, fines/fees by finding missed revenues or cases where assessments are lower than called for by law or regulation.
Energy costs and efficiency	H	The rising cost of energy is impacting all operational areas in the public and private sectors. GIS technology plays a role in supporting analysis, decisions, and policies for two key areas: a) energy efficiency and savings, b) exploring opportunities for alternate energy sources. Both of these challenges have a strong geographic component (e.g., using GIS to examine vehicle mileage and determine more efficient vehicle use, GIS applications to support exploration for wind and solar energy sources).
Enhancement of environmental quality, sustainability, and livability	H	Protection and enhancement of environmental quality of the state involves planning and regulatory programs and initiatives of the public and private sectors that are geographic in nature. Environmental quality is a factor in well-being and health of Idaho citizens, but it also directly impacts economic development and tourism factors.
Management and access to historical geographic information	MOD	Historical information, often with a geographical reference, is needed regularly to support legal analysis, engineering design, land use decisions, growth projections, and policy analysis. GIS technology provides effective ways to capture, organize, and provide access to this historical data.
Improved geographic data quality and currency	MOD	GIS supports quicker and more accurate update of maps and geographic databases. GIS tools ensure data quality, adherence to standards, and reduction in redundantly maintained data.
Support for private business	MOD	Coordination between public sector and private company users of GIS data (title companies, land development companies, VARs).

* Priority: Very High (VH), High (H), Moderate (MOD)

Other business drivers are more specific to an individual department or organization, business area, or program. These program-specific business drivers for the Idaho SDI are explained below in Table 4.

Table 4: Program or Discipline-Specific Business Drivers

Business Driver	Priority*	Opportunities for Idaho's SDI
Emergency planning/ management and public safety	VH	GIS provides direct support for public safety and emergency management organizations (local and state law enforcement, emergency operations, fire protection, rescue, emergency medical). GIS data supports emergency and public safety planning, and GIS data and tools support emergency event management and response. The range of applications is large and includes: preparation of emergency evacuation routes, local agency police/fire dispatch, better definition of jurisdictional responsibilities for response, mapping of wildland/urban interface, coordination of search and rescue operations, threat/vulnerability assessment, crime analysis and investigation.
Real property appraisal	VH	Support for more complete, accurate and equitable property appraisal. GIS allows more effect analysis of neighborhood variables impacting valuation and can result in increase of tax revenue through more complete, accurate appraisals.
Infrastructure facility management	H	Support for facility inventory, tracking of condition and maintenance actions (transportation and utilities), and capital projects planning. The result is considerable cost savings and better service to citizens. This is of particular importance given assessments of infrastructure condition and funds that will need to be spent over the next decade to maintain a reasonable level of efficiency and safety. See "report card" from the ASCE (www.asce.org).
Economic development and tourism promotion	H	GIS can provide information in map form, accessible through convenient search interface for government staff and external parties looking for development sites, improving opportunities for site location. GIS in itself is an incentive for many types of companies. GIS can support access to information on touring opportunities which can stimulate tourism.
Agricultural productivity and invasive species management	H	GIS supports efficient monitoring of agricultural productivity and planning for seasonal cultivation and agricultural improvement practices. GIS technology is also effective in helping to control invasive plant and insect species which has a huge impact on agricultural and forestry health and productivity as well as impacts on recreational lands.
Land development planning	H	Support for evaluation of land development scenarios by providing access to and analysis of a wide range of geographic information on land use, infrastructure, demography, infrastructure, etc. GIS saves time and cost in the planning process and supports an end result which better reflects local and regional conditions and balances issue of economic health, business growth, environmental impact, and quality of life.
Facility planning and design	MOD	Use of GIS data and tools to support road and utility design, greatly reducing need and cost for collection and formatting of new information (base map, parcels, etc.). Coordination between government agencies and private engineering contractors in design projects.
Floodplain/flood event management	MOD	Access to accurate floodplain mapping; use of GIS for open space planning and floodplain management to guide more effective development decisions and support emergency planning and vulnerability assessment.
Support for improved regulatory decisions	MOD	GIS data and analysis tools can help answer questions driven by a variety of regulations impacting local and regional issues (e.g., zoning and local LU decisions, permitting requirements, Forest Practices Act decisions about private forest management, ID Water Resources water use restrictions, water rights decisions, many others). GIS can better equip government agencies to administer requirements of new regulatory requirements while reducing needs for great increases in staff and resources.

Table 4: Program or Discipline-Specific Business Drivers (con't)

Business Driver	Priority*	Opportunities for Idaho's SDI
Educational program enhancement	MOD	GIS technology and the data resources and services provided through a statewide SDI support a range of educational needs at the elementary, high school, college level. The SDI will support the teaching of geographic concepts and enhance existing school programs in science, social studies, mathematics, and computer instruction. At the university level, SDI will support already active programs and research activity that result in the training of students in applying geospatial technology to a wide range of disciplines.
Support to county commissions	MOD	GIS as tool to support Commission meeting issues and policy decisions.
Grant application support	MOD	Access and presentation of geographic information in grant applications (e.g., Homeland Security) providing effective ways to prepare grant applications with greater chance of grant approval.
Public health management	MOD	Support for health services planning and allocation of resources for public health programs at the state and local level. Mapping and geographic analysis tools can provide means for better program planning and more efficient allocation of resources where the need is higher. GIS provides an effective tool for evaluation of health problems and patterns, and indicators and can be used as a decision support tool.

* Priority: Very High (VH), High (H), Moderate (MOD)

3.6.2 Types of Benefits from GIS

Experiences through over 20 years of successful GIS deployments in the USA provide strong evidence that GIS delivers tangible benefits that can be measured in monetary or other terms, as well as many other benefits, more difficult to quantify, which result in significant improvements to organizations. Benefits from the use of GIS technology and data generally fall into the following categories:

- Operational and Efficiency Gains: Expected gains in current personnel efficiency and productivity allowing work to be accomplished in less time and with less expense.
- Cost Savings: Reduction in current monetary expenses such as contract costs and direct expenses.
- Cost Avoidance: Lowering or completely avoiding increased costs that would be incurred without the use of GIS technology, when new programs, regulatory requirements, or other new demands are placed on existing organizations.
- Revenue Enhancement: Use of GIS technology and data in applications and business processes that result in increased revenue from existing or new sources.
- Difficult-to-Predict Quantitative Benefits: Potential benefits that can be measured in monetary or other terms (time, volume, etc.) but which are not easily

predictable or regular in nature and which do not easily contribute to a return on investment analysis.

- Non-quantifiable Benefits: Benefits that cannot be easily quantified but which have positive impacts on operations, decision-making, quality of service, or a range of social and long-term benefits to economic or environmental health.

Some examples of benefits that fall under these benefit types are listed below in Table 5. Some of the benefit examples are listed under multiple categories since they are subject to different levels of measurability.

Table 5: Examples of GIS Benefits

Examples of Benefits from GIS Programs	Benefits			
	Operational/Efficiency Gains	Cost Savings,/Avoidance, Revenue Enhancement	Difficult to Predict Quantifiable	Non-quantifiable
Staff productivity & labor cost savings for existing operations (reduction in labor time expressed in monetary terms)	X			
Reduction in duplication and redundancy (savings of direct costs and labor time)	X	X		
Efficiency and monetary gains in better real property transaction management (sale, lease, acquisition of land, buildings, and other real property)		X	X	
Avoidance of new costs (e.g., for responding to new regulations, legal cases, or new or expanded program requirements)		X	X	
Savings in capital project or engineering projects through use of GIS resources to reduce costs of contracts for data collection, analysis, design, and planning		X	X	
Reduction in contract costs for mapping, surveying, and field data verification		X		
More effective management/allocation of field facilities and services (allocation of services by field personnel, siting of facilities for emergency, health, social services)		X	X	X
Protection from catastrophic loss of hard copy records		X		
Public revenue increase by providing support for insurance claims (e.g. property damage) or better insurance rates for government jurisdictions and property owners		X	X	
Public revenue increase from improved fee or tax collection, (e.g., real property tax, utility billing, storm water utility assessment)		X	X	
Revenue from sale of GIS products or services		X	X	
Increase in economic development competition and decisions			X	X
Enhancement of natural/environmental quality (e.g. better planning and management results in enhancements to land, water, landscape with resulting tangible and intangible benefits)			X	X

Table 5: Examples of GIS Benefits (Con't)

Examples of Benefits from GIS Programs	Benefits			
	Operational/Efficiency Gains	Cost Savings,/Avoidance, Revenue Enhancement	Difficult to Predict Quantifiable	Non-quantifiable
Saving of property and life through more effective emergency response			X	X
Quicker turnaround for permit, plan and license review and approval				X
More efficient planning decisions and operations on resource exploration, extraction and management			X	X
Better information and service to customers and the public (e.g., support for e-gov and e-commerce)		X	X	X
Cost savings and revenue increases through improved provision of commercial and retail services (e.g., siting of new facilities, marketing to customers)		X	X	
Support for strategic and comprehensive planning and projections (land use, business, economic)-better planning and impacts on improve long-range decision making.			X	X
Avoidance of costs from legal claims (using geographic information to dispute claims for damages—auto accidents, property damage)		X	X	

The types of benefits described above reflect actual experiences of many government and private organizations which have realized tangible value for their GIS programs. Appendix A includes selected examples of benefits that have been achieved throughout the USA, demonstrating opportunities that exist for Idaho organizations.

3.6.3 Actual Anticipated SDI Benefits for Idaho

Idaho organizations in the public and private sectors have received substantial benefits from GIS technology since the mid-1980s. The development of Idaho's SDI, through implementation initiatives described in this Business Plan, is designed to build on past successes and expand benefit opportunities for Idaho. Listed below are some actual tangible cases of GIS benefits achieved by government agencies and private companies in Idaho.

- In its almost eight years of operation, Idaho's main Web-based portal for access to geographic data, INSIDE Idaho, has filled approximately 350,000 requests for data through its easy to access data search and download capabilities. A breakdown on the type of users includes approximately 38% government, 30% private companies, and 32% from the general public. The Web-based search and access

feature saves users thousands of hours annually in locating and accessing data and sizable avoided costs in data gathering and compilation.

- Coordination of Idaho's geospatial community has helped to enable the state (through matching funds) to take advantage of the federal NAIP program for acquisition of full state coverage of orthoimagery (including existing 2004 imagery, scheduled acquisition in 2009, and projected acquisition in 2012). Each statewide acquisition has provided over $1.2 million in funds from the federal government for imagery collection and processing. The imagery is heavily used by government and private sector users saving hundreds of thousands of dollars each year in acquisition costs.
- Water rights adjudication impacts many property owners and the resources of state and local governments to examine and settle cases. GIS technology and data (imagery and base map data) are used frequently by owners, government officials, and law firms involved in the cases. GIS technology and available data saves approximately thousands of hours of time (administrative and professional time) in collecting and analyzing geographic data which forms the basis of water rights adjudication cases
- Ada County has achieved cost reductions of over $12,000 annually in managing mosquito abatement operations. GIS technology and data has allowed County staff and contractors to save time and direct costs in generating maps and operational planning for chemical applications. Similar benefits could be duplicated by other government agencies throughout the state.
- The Idaho Department of Lands. Federal agencies with land management responsibilities and local fire protection organizations use GIS to save time (labor time and response time), property, and lives in fire protection planning and response. The IDL has documented the value of GIS in such areas as: monitoring weather conditions and fire threats, planning for evacuation and response, organizing logistics of fire response, monitoring progress of active wildfires, assessment of fire event results and planning for future mitigation of fire damage.
- A number of major agricultural producers in Idaho rely on GIS technology and data to plan cultivation, monitor and support treatment of crops during the growing season, and manage harvesting operations. This is the case for United Potato that uses GIS to estimate production volumes—figures that contribute to board of trade commodity futures prices. In Idaho, as in other locations in the USA, precision agriculture is becoming an important tool for farmers with a promise of substantial savings (in labor and material costs).
- Governmental jurisdictions in northern Idaho have collaborated with Avista Utilities for joint funding for high-resolution orthoimagery. This effort has delivered thousands of dollars in cost savings in economy-of-scale savings to multiple city, county, and utility users. This is a financing and organizational model that could be duplicated in other areas of the state.
- The Confluence Waterfront Coalition (in Nez Perce County region) is using GIS to support its review of water front use and to assess alternatives for balancing

waterfront and water way uses for commerce, commercial development, etc.). GIS use has resulted in substantial reduced costs—thousands of dollars in labor efficiency and avoided costs for data collection—in this important regional economic development planning initiative.

- A number of county and city governments have deployed interactive Web-based GIS parcel view applications which increases parcel map access by land owners, realtors, business owners, and internal staff with substantial savings of staff time in responding to requests for information. Some examples of these applications include: City of Moscow, Bonneville County, Teton County, and Ada County.
- Most County Assessors that have deployed automated parcel mapping and GIS have achieved benefits in the property appraisal process. These benefits address several related areas: a) cutting labor time in property appraisals—especially rural properties through access to image data, b) improving the completeness and consistency of property appraisals by using GIS to evaluate and compare geographic factors that contribute to real property valuation—resulting in more comprehensive and equitable appraisals and reducing citizen appeals, c) finding errors that result in under taxation, thereby increasing overall tax revenues and equity for property owners.
- The City of Jerome uses GIS for accurate water line and hydrant mapping to support system improvements in water distribution efficiency and coverage. This resulted in a significant reduction of insurance rates by private providers for property owners and businesses.
- GIS was used to generate landslide study maps by the Nez Perce County GIS program, resulting in savings of $45,000 in archaeological consulting fees for the County Waterway Committee by showing an area of development was manmade landslide material. Also, during the flooding of 2006, the County used its GIS to provide FEMA with accurate, detailed maps of affected properties and roads. Using The County's GIS-generated maps and data, FEMA was able to quickly respond and have accurate information for later mitigation efforts.
- Multiple local government jurisdiction and engineering consulting firms have used GIS data and mapping capabilities to reduce the cost (by as much as 50%) of engineering design projects for road, bridge, and utility construction projects. Cost savings comes from ready access to digital map data and imagery which would defrays costs for new data collection and compilation.
- Sentry Dynamics, a GIS consulting firm, has developed GIS applications for the timber industry which have resulted in cost savings and efficiencies for timber volume assessment and management of property and leases.
- Motorola created service coverage maps for Idaho using different scenarios for the placement of towers to support the planning and deployment of the 700/800 megahertz Public Safety radio network. Topography of different regions was modeled and radio coverage layers were developed to assist in Motorola's bidding and contracting requirements. The coverage maps are created in mapping software that was written by Motorola. The ability to use the spatial data to create

these coverage maps and resulting service area analysis provides Motorola the information to be competitive in the market.

- Bonner County saves staff time spent in processing land use applications. Use of GIS for owner notification required for land use and zoning actions results in a savings (in staff labor efficiency) of over 75%. Similar labor efficiencies are seen in the review and processing of land use applications (e.g., zoning actions) requiring access and analysis to multiple GIS map layers and data. These GIS benefits have been achieved by other local governments and represent a major reduction in staff time for developing areas of the state.
- GIS technology plays a major role in supporting the information management needs numerous military installations in Idaho that support training, testing, weapons and equipment maintenance, and other services for the National Guard (through the Division of Military Affairs) and branch services of the Department of Defense. GIS has delivered the benefits worth millions of dollars in recent years through reduced contract costs and labor for such applications as: a) design and management for new facility construction projects, b) ongoing facilities management, c) environmental studies, and d) planning for military exercises. GIS technology used for these purposes makes use of data being developed as part of the SDI and is a basis for attracting federal funds to support military facilities and DoD missions.

The list above gives a selected picture of the practical impact and business value of GIS technology. What type of benefits will be achievable in the future with a strengthened, active SDI? The tangible and non-quantifiable benefits are substantial. The improved coordination and management provided by the SDI program will help Idaho organizations save money, time, improve operations, and plan for the future. In brief, these benefits will be exhibited in the following ways:

- Cost savings by leveraging economy of scale through coordinated GIS database development and application projects
- Efficiency, time savings, and cost reductions through improved Web-based access to a wide range of high-quality GIS data that supports the business needs of a large statewide user community
- Cost savings from a consolidation and better management of computer hardware, software licenses, and associated maintenance/support contracts
- Cost savings and efficiency gains by leveraging existing applications (deployed by state agencies and local governments) and expanding their use to a larger user community through improved coordination and management enabled by the SDI program
- Cost avoidance through a more effective use of GIS technology and GIS integration with other information systems—allowing government agencies and business to respond to increased demands without significant increases in staff

- Support for critical business drivers (public safety, energy efficiency, infrastructure management, etc.) through the deployment of new, innovative applications—enabled through an improved environment of professional collaboration and partnerships
- GIS support for economic development initiatives by providing tools and geographic data that increase awareness of Idaho as a destination for visitors and its attractiveness as a location for business development
- Positive economic impacts and cost savings through GIS-based public-private partnerships with mutual benefits for government agencies and private companies (e.g., utility companies)
- Improvements in education through the promotion of GIS education and practical training in high schools and state universities in multidisciplinary educational environments which offer greater opportunities for high-technology jobs

3.7 HIGH-PRIORITY USER AND APPLICATION FOCUS

Development of the SDI involves many "behind the scenes" development activities that establish a strong foundation for long-term success and delivery of benefits to stakeholders. Work on standards, development of a high-quality geographic database, and the establishment of an effective governance and management structure are the basis for the deployment of applications that puts data and GIS services into the hands of users. While some GIS applications will require substantial time for full development, this Business Plan calls for the early development and deployment of several high-priority GIS applications that have considerable business impact. These applications leverage the capabilities of existing GIS software and, in some cases, existing custom applications deployed in a limited environment. With the assumption that resources can be found for their development, several high-priority applications are candidates for early development (see Appendix B for more information about these potential applications):

- State Lands Management (IPRS)
- Statewide Map Viewer
- Executive Map-based Dashboard with "Geostatistics"
- State Road Inventory
- Wind Energy Potential Analysis
- Water Use and Conservation Analysis
- Water Rights Adjudication
- School Bus Allocation and Planning
- Vehicle Trip Mile Analysis
- "After 3:00" Youth Program Locator
- Address-based Government Look-up
- Emergency Services Radio Communications Planning
- Economic Development Site Selector

4. IMPLEMENTATION INITIATIVES, TIMING, & RESOURCE REQUIREMENTS

This section describes the details of the five-year work program to accomplish the strategic SDI goals presented in Section 3.

4.1 HIGH-LEVEL GOAL ELABORATION

The high-level SDI goals are re-stated below with additional information on their context and scope:

1. Develop a strong business justification to cultivate high-level support and sustained financing for the SDI.

Goal 1 Context and Scope: SDI development and ongoing operation will require the allocation of funds and staff time from multiple sources, and approval for such allocation is dependent on demonstrating the SDI business need to senior officials and decision makers. In addition, establishing a business justification will help focus GIS development and deployment on applications that will deliver the greatest benefit to organizations and users. With a sound business case established, long-term SDI success will require sustained, multi-year funding from several sources, and the direct involvement and support from senior officials.

2. Implement an improved SDI management and coordination structure with appropriate legislation, policies, and management practices that supports full SDI development and its ongoing operation and which promotes statewide participation and collaboration.

Goal 2 Context and Scope: There are limitations in the current SDI organizational structure that present obstacles for achieving SDI goals and realizing all potential benefits from GIS technology. Specific improvements are needed to improve statewide coordination and program management. Revised and strengthened mandates (legislative action and executive orders) should be established along with a more comprehensive and clear set of policies, procedures, and management practices.

3. Define standards for and complete development of Framework data, and establish tools and procedures for perpetual data maintenance and appropriate access.

Goal 3 Context and Scope: Significant progress has been made in geographic database development, but much work remains to be done to achieve statewide coverage of Framework themes. This database development requires clear data standards and technical specifications to ensure statewide consistency and to give a basis for cost-effective development. Full success of the SDI program is dependent on statewide database completion, so this goal is critical for achieving the long-term SDI vision.

4. Leverage emerging technologies to enhance access and use of SDI data and services.

Goal 4 Context and Scope: Long-term success of the SDI program will require effective use of GIS technology and leveraging of advances in software, computer hardware, networks, web-based architecture, and system/database development methodologies. Through an ongoing monitoring and evaluation of industry trends and products (see Goal #9), the SDI program will include policies and procedures that will guide the procurement of products and services and channel these in a way that maximizes the effectiveness and benefits from system deployment and operation.

5. Connect and integrate state and local/regional activities by establishing region-based resources that provide practical help, enable professional networking, disseminate best practices, and act as a consistent, multi-directional channel of communication.

Goal 5 Context and Scope: Statewide SDI coordination requires the active participation of user groups and jurisdictions throughout the state. This coordination and participation can best be achieved through a regional presence that offers users in different areas of the state representation and access to GIS support and services at locations within a reasonable geographic proximity.

6. Increase awareness of and support for the SDI program and its benefits.

Goal 5 Context and Scope: Gaining and maintaining support for and participation in the SDI will require active promotion and outreach directed at different communities: senior management/decision makers, program and operational managers, and users. Through the use of multiple communication channels (print and electronic media, conferences, participation at events of professional associations, web resources), this promotion and outreach will focus on education about what SDI is and the value and benefits that the SDI program and its resources can deliver.

7. Encourage, provide guidance, and help establish financial support for development and maintenance of non-Framework geographic data that enhance organizations' use of and benefits from GIS technology.

Goal 7 Context and Scope: While Framework database development is a priority for the SDI program, the importance of geographic data beyond Framework themes is recognized as well. Development of non-Framework themes will be the primary responsibility of individual organizations and user groups, but support should be provided through the SDI program. This support may take the form of coordination in the development of data standards and specifications, enabling partnerships and collaborative projects, and supporting efforts for the integration of Framework and non-Framework themes.

8. Expand the awareness of the GIS technology and integration of geographic information in organizations, disciplines, and applications in which GIS use is not common but where substantial benefits may be achieved.

Goal 8 Context and Scope: There are substantial opportunities for the application of GIS technology in "nontraditional" domains, that is, disciplines and organizations that have not made extensive use of the technology in the past. These nontraditional areas can make use of geographic information and analysis tools (although not necessarily map-based applications) by integrating GIS with other systems and embedding GIS objects with "non-GIS" applications. Realizing this goal will require active work to investigate these opportunities and leverage GIS technology and data in new areas.

9. Maintain current knowledge about GIS and information technology trends and industry offerings to take advantage of new products, tools, and practices.

Goal 9 Context and Scope: Information technology is continually changing and new concepts, products, and practices are being made available to support new and enhanced applications. It is critical to keep current with these changes to support decisions about when and how to adopt new approaches and products. This requires ongoing monitoring of the industry and research to make most effective use of these changes.

4.2 IMPLEMENTATION INITIATIVES

The implementation initiatives presented here identify areas of work organized under each of the high-level goals. These implementation initiatives together form a comprehensive work program which establishes a framework for specific work activities for accomplishing the SDI goals. This section presents the implementation initiatives and assigns a priority score to provide a basis for detailed planning and execution of work elements. The priority is a relative indication of the initiative's importance to goal accomplishment and the urgency for carrying out the necessary work. Priority scores are:

- **Very High (VH)**—Fundamental for the accomplishment of the designated strategic goal with most other goals dependent upon it. It is critical that major progress be made on this initiative by the end of Year 1 (2009).
- **High (H)**—Very important for accomplishing the overall mission with multiple goals dependent upon major progress. Work should begin as soon as possible with planned completion or major progress by the end of Year 3 (2011) or sooner if possible.
- **Moderate (MOD)**—Significantly impacts achievement of the overall mission and other selected goals. Work should begin by the middle of Year 2 or before with planned completion or major progress by the end of Year 4 (2013) or sooner if possible.
- **Low (L)**—Important for overall success of SDI development, but there is flexibility in work scheduling given resource and time limitations. These initiatives should be scheduled and work initiated as resources permit with a projected completion by the end of Year 5 (2014).

Table 6 identifies the SDI implementation activities, their priority, and a summary of expected results—against which implementation performance will be gauged. Appendix C provides an explanation of these initiatives and their relationship to SDI goals. Implementation initiatives are organized by the following categories:

- Organizational and management structure and practices (O)
- Data development or management (D)
- System configuration, software, or application development and operation (S)
- Education, outreach, and internal/external communications (E)
- Funding, budgeting, cost-benefit evaluation, and financial management (F)
- Legal or policy development and management (L)

Table 6: Explanation of Implementation Initiatives

	Implementation Initiative (Organized by Category*)	**Priority**	**Result/Performance Milestones**
Organizational and Management Structure and Practices			
O1	Improve and clarify role and composition of IGC	**VH**	• Establish new IGC and Executive Committee with formal Executive and/or legislative mandate • Prepare bylaws and procedures • Appoint leaders and members • Working groups and committees recommissioned
O2	Set up templates, practices, and procedures for overall plan monitoring and reporting	**VH**	• Monitoring procedures and practices defined in writing • Templates and tools for progress reporting created
O3	Set up templates, practices, and procedures for detailed work plan preparation and management	**VH**	• Monitoring procedures and practices defined in writing • Templates and tools for progress reporting created
O4	Refine and finalize formal procedures and policy for data standard development and approval	**VH**	• Approved procedures • Procedures communicated to and accepted by stakeholders
O5	Establish and formalize state agency stakeholder coordination group	**VH**	• Group formally established through executive action • Bylaws established • Members assigned
O6	Support formal legislative recognition of State CIO Office	**H**	• Formal resolution from IGC supporting CIO Office creation • CIO Office created with IGO identified
O7	Establish more formal geographic data sharing cooperative	**H**	• Documented consensus on cooperative requirements and options • Draft design/terms for data sharing cooperative • Finalization/approval of cooperative terms and approach
O8	Explore and define options for providing GIS services to low-resourced jurisdictions	**H**	• Complete research on outsource providers and options • Create directory of outsource providers • Prepare template terms for outsource arrangements • Ongoing facilitation to support outsource arrangements

Table 6: Explanation of Implementation Initiatives (con't)

	Implementation Initiative (Organized by Category*)	**Priority**	**Result/Performance Milestones**
Organizational and Management Structure and Practices			
O9	Establish Regional Centers as part of SDI organizational structure	**H**	• Define requirements and create model for regional center operation • Identify candidates/locations for regional centers • Set up regional centers (incrementally)
O10	Create "template" organizational structure and policies to support enterprise GIS development	**MOD**	• Create organizational/policy model for enterprise GIS for state agencies and local governments • Distribute and communicate enterprise model • Support/facilitate enterprise GIS adoption
O11	Reduce redundancy and duplication of similar data sets in government agencies	**MOD**	• Create standard data models as basis for reduction in duplication • Prepare business case for reducing duplication • Prepare approach/tools for evaluation of data duplication and design of enterprise data management • Facilitate/support stakeholder work and identify "success stories" in reduction of duplication
Funding, Budgeting, Cost-benefit Evaluation, and Financial Management			
F1	Business case and materials for promoting GIS	**VH**	• Prepare business case flyer (from *Business Plan* material) • Prepare project-specific business cases • Conduct management briefings
F2	Review and re-introduce legislation for County Recorder fee	**VH**	• Prepare and get consensus on wording for legislation (including rules on collection of fees and use of fund) • Get legislative support • Approve legislation • Prepare administrative and financial procedures and tools to operate and manage fee collection and fund
F3	Seek state "base funding allocation" to support key SDI development	**VH**	• Prepare budget requests and supporting materials for senior management • Hold management briefings to support/justify budget requests • Budget requests are approved by legislature (over multiple fiscal years)
F4	Identify and focus development on several key business areas and "critical applications"	**VH**	• Define and reach consensus on priority several near-term compelling applications • Get support/resources for development of selected apps • Complete application design • Complete development and deploy
F5	Explore, make recommendations for, and secure nontraditional funding sources. (see Section 4.5 for discussion)	**H**	• Research, identify, and prioritize sources • Make formal requests and attempts to secure funding • Secure nontraditional sources
F6	Improve coordination of E911 funding mechanism	**MOD**	• Research and make recommendations for funding coordination • Changes in fund allocation (to support standard GIS database development) are approved • Modifications to fund administration are put in place

Table 6: Explanation of Implementation Initiatives (con't)

	Implementation Initiative (Organized by Category*)	**Priority**	**Result/Performance Milestones**
Funding, Budgeting, Cost-benefit Evaluation, and Financial Management			
F7	Examine and confirm state purchase contracts and enterprise license agreements with specific GIS vendors	**MOD**	• Complete inventory of GIS software licenses (ESRI and other vendors) and identify future license needs • Solicit offer for enterprise license arrangements and get costs • Compare current costs vs. enterprise license costs • Negotiate and ratify enterprise license agreements and software support contract costs
Legal or Policy Development and Management			
L1	Clarify and potentially amend state public records laws	**VH**	• Research and prepare position paper on issues and solutions • Prepare guidelines for interpretation (impacts on GIS programs) of current law • Submit suggested amendments for legislative action • Legislature approves changes
L2	Support formal legislative recognition of State CIO Office	**H**	See O2
L3	Seek state legislation as basis for stronger statewide SDI governance	**H**	• Research and compare GIS legislation in other states • Draft recommended legislation and get high-level support • Prepare and submit bill for legislature • Legislature approves GIS legislation
L4: Develop, enhance, and approve formal policies, procedures, and formal practices:			
L4a	Policy for SDI standards consensus and approval	**H**	• Research and prepare draft policies • Get input and get consensus in IGC • Submittal to ITRMC • ITRMC approves policy • Distribute/Communicate policy to stakeholders
L4b	Policy for statewide geographic data sharing (data cooperative)	**H**	
L4c	Policy on SDI plan and project management and reporting	**H**	
L4d	Agreements and formal procedures defining responsibilities and practices for Framework data stewardship	**H**	
L5	Develop template database specifications and procurement templates	**MOD**	• Set priorities for database specification needs • Create draft templates for selected themes • Review and revise templates • Distribute templates and explain/promote their use • Achieve active use of templates
L6	Records Retention	**L**	• Review of current records retention schedules/policies • Define record series and retention for GIS records • Approval of retention schedules
Geographic Data Development or Management			
D1	Revise/reach consensus on Framework	**VH**	• Identify additional Framework themes revised set of Framework themes and reach consensus in IGC • Identify datasets for themes • Assign leaders to all themes and priority dataset work groups

Table 6: Explanation of Implementation Initiatives (con't)

	Implementation Initiative (Organized by Category*)	**Priority**	**Result/Performance Milestones**
Geographic Data Development or Management			
D2	Process results from IACA parcel needs survey and develop conclusions	**VH**	• Get "critical mass" of responses submitted • Review and follow-up on responses as necessary • Compile results • Prepare and distribute summary report
D3	Examine and resolve boundary problems with Census enumeration areas	**VH**	• Examine nature and extent of problem by jurisdiction and document • Prepare guidelines for use by local governments to revise discrepancies • Encourage/support resolution of discrepancies • Resolve discrepancies as part of Framework database development
D4	Complete development of Framework data	**VH, H**	• Assign responsibilities and establish priorities for Framework development • Prepare Work Plans and get resource commitments • Initiate/Accelerate database development • Complete statewide Framework data development
D5	Formalize long-term program and sustained support for Orthoimagery enhancement	**H**	• Set up fund for future orthoimage development and promote participation • Get funding commitments for enhanced orthoimage acquisition • Organize program for 2012 NAIP
D6	Designate responsibilities and develop procedures for Framework data stewardship	**H**	• Get consensus and commitments for stewardship responsibilities • Define and document procedures and workflow for data update, quality control, and posting • Develop and put in place technical tools
D7	Improve approach and tools for notification of database updates and for easy search and discovery of the current authoritative source	**H**	• Identify clear, authoritative source for all geospatial data • Create, update metadata with source/custodian information • Develop and deploy web-based search and notification tool
D8	Encourage and coordinate capture and management of data to support public safety response	**H**	• Define data requirements and identify sources • Create data model that addresses public safety needs • Prepare template specifications and procedures for compilation of data
D9	Reduce redundancy and duplication of similar data sets in government agencies	**H**	See O10
D10	Establish more formal geographic data sharing cooperative	**H**	See O6
D11	Update Idaho metadata profile and develop more effective metadata management tools	**H**	• Get input on requirements for changes to current profile • Prepare draft revised profile and distributed for review • Prepare/reach consensus on review profile • Submit for formal standards approval • New metadata profile is approved • Distribute/communicate revised profile and build into automated tools for metadata management

Table 6: Explanation of Implementation Initiatives (con't)

	Implementation Initiative (Organized by Category*)	**Priority**	**Result/Performance Milestones**
Geographic Data Development or Management			
D12	Establish Web-based service for input of and access to information on qualified survey control and monumentation	**H**	• Evaluate existing tools and define requirements for automated service • Develop and deploy service in pilot mode • Revise and redeploy for operational use • Communicate to surveying community and promote use
D13	Define long-term approach for resolution of problems with governmental boundary placement	**H**	• Research and document the nature and extent of problems • Prepare Work Plan for short-term and long-term resolution steps, including resources and schedule • Initiate work and complete plan milestones • Resolve all important boundary problems (long-term)
D14	Create index of Web-based geographic data sources and services	**H**	• Evaluate existing indexes and define requirements for additional enhancement • Design enhanced index • Develop prototype and test • Develop operational version and deploy for use • Communicate availability to user community
D15	Develop template database specifications and procurement templates	**MOD**	See L5
D16	Promote use of the single state coordinate system and deploy tools for effective software use	**MOD**	• Develop tools (plug-ins) for GIS use of single state coordinate system • Communicate and promote use of single state coordinate system and plug in tools • Achieve substantial awareness and adoption
D17	Establish program and provide ongoing guidance for non-Framework database development	**MOD**	• Identify non-Framework themes of interest to stakeholders and characterize general content and format • Develop standards for selected non-Framework themes • Encourage and support development of non-Framework data
D18	Explore and design approach for archiving and management of historic data	**L**	• Research and develop general data model for historical data management • Design detailed data model for historical data management • Prepare guidelines for capture and access to historical data in GIS search and query applications
System Configuration, Software, or Application Development and Operation			
S1	Improve INSIDE Idaho support and services and enhance connections and access to distributed Web-based services	**VH**	• Identify needs for service enhancement/improvements • Prepare Work Plan for improvements, including resources and schedule • Get funding allocated and assign resources • Complete prototype enhancements and test • Revise and complete operational enhancements

Table 6: Explanation of Implementation Initiatives (con't)

	Implementation Initiative (Organized by Category*)	Priority	Result/Performance Milestones
System Configuration, Software, or Application Development and Operation			
S2	Complete data standards for Framework themes	**VH**	• Prioritize standards development efforts • Research and gather information on existing standards (inside and outside Idaho) • Develop draft standards (incrementally theme by theme) • Review and revise standards and submit for formal acceptance • Approval of standards by IGC and ITRMC
S3	Identify, design, and develop several enterprise GIS applications	**VH, H**	• Evaluate and select applications for initial development • Secure funding and resources for application develop • Assign team and user reviewers • Examine existing applications and design new enterprise applications • Prepare application prototypes • Get review comments, revise and deploy in operational setting • Communicate and promote use of applications
S4	Encourage and support Improved statewide wide area network communications	**VH**	• Review current network shortcomings and prepare white paper on GIS access impacts • Provide IGC support and endorsement for efforts to improve network connectivity and performance
S5	Move toward statewide 'virtual portal" for Web-based access to spatial data and services and leverage national portals and state inventory	**H**	• Prepare needs assessment and design options for "virtual portal" • Reach consensus on approach and prepare conceptual design and cost estimates • Secure funding for design and development • Organize project team • Prepare technical design and plan • Develop initial version of virtual portal and track use
S6	Complete development and deploy integrated property records system (IPRS)	**H**	• Prepare prototype and get review comments • Develop and deploy operational version • Communicate availability and train users
S7	Examine current GIS software licenses and costs and evaluate options for changes	**H**	See F7
S8	Work with IT Staff to examine server HW in state government and move toward server consolidation to reduce cost and system administration requirements	**H**	• Prepare inventory of server and storage hardware dedicated to or used largely predominantly for GIS data, software, and applications • Determine needs for upgrades and examine options for server consolidation or outsourced hosting • Over time, retire old servers and consolidate GIS operations on fewer, lower cost servers
S9	Create index of Web-based geographic data sources and services	**H**	See D13

Table 6: Explanation of Implementation Initiatives (con't)

	Implementation Initiative (Organized by Category*)	Priority	Result/Performance Milestones
System Configuration, Software, or Application Development and Operation			
S10	Integrate GIS with "non-GIS" systems and databases	**MOD**	• Examine and prioritize specific needs and opportunities for GIS integration • Select high-priority GIS integration projects and secure funding support • Assemble team and prepare Work Plan(s) • Prepare integration design and begin development • Prepare prototype integration applications • Review, revise and deploy integration applications • Document applications and train users
S11	Explore new application technologies and recommend adoption as appropriate	**MOD**	• Set up Working Group with responsibility to monitor and provide information on industry advances and impacts • Prepare position statements on technology changes and products for future adoption
S12	Monitor and exchange information on industry trends and developments	**MOD**	• Make formal recommendations for adoption of new products, technologies, and methodologies • Set up Web-accessible link for exchange of information on industry trends and products
S13	Continue to monitor and identify opportunities for new applications of GIS technology	**MOD**	• Continually monitor state and local programs, regulations, initiatives for opportunities in applying GIS technology • Explore opportunities and make "pitch" for use of GIS • Reach agreement on new projects for GIS applications and secure funding • Support design, planning, and assembling team and resources for application development
S14	Design and move toward server-centric model for GIS	**L**	• Prepare revised logical and physical database designs supported server-centric GIS (for implementation in ArcGIS Server or other software) • Implement server centric architecture in state agencies
S15	Develop guidelines for system administration and security for GIS configurations	**L**	• Identify security concerns for GIS • Work with IT staff at state and local level to prepare draft system security requirements • Prepare guidelines for use in procurement and installation of systems
Education, Outreach, and Communications			
E1	Prepare SDI "Communications and Promotion Plan", execute and monitor actions	**VH**	• Complete outline and reach consensus on content • Complete plan • Assign roles and initiate action
E2	Engage and recruit participants for the newly formed Idaho Geospatial Council	**VH**	• Identify potential organizations and individuals for IGC membership • Prepare materials explaining the new SDI governance structure • Actively solicit organizations and individuals for members • Get volunteers and confirm members
E3	Actively pursue outreach with professional and industry associations	**H**	• Identify professional and industry groups and events • Pursue opportunity for communications with these groups and participation in events • Prepare outreach materials (presentations, flyers) appropriate for these bodies • Have formal communication and event participation with the groups

Table 6: Explanation of Implementation Initiatives (con't)

	Implementation Initiative (Organized by Category*)	Priority	Result/Performance Milestones
Education, Outreach, and Communications			
E4	Create and maintain a GIS-enabled directory of GIS contacts and personnel around the state.	**H**	• Assign team and prepare work plan for directory development • Examine other GIS contact directories and design directory format and technical architecture • Develop prototype directory and test • Populate with initial set of contacts and deploy • Communicate directory availability, encourage access, and entry of revised or new contact information
E5	Establish Regional Centers as part of SDI organizational structure	**H**	See O8
E6	Prepare GIS education/training plan and put in it in place	**H**	• Assign person/team for plan preparation • Reach consensus on overall goals • Prepare draft plan • Get review comments and prepare final plan • Allocate resources for acting on plan recommendations and initiate work • Make progress on plan objectives
E7	Provide better access to educational materials and professional networking	**MOD**	• Identify needs and potential approaches for improved access to educational materials and professional network • Design solutions for improved access and networking • Allocate resources and initiate work on improvements • Put in place improved environment, tools, procedures for access to materials and professional networking
E8	Compile and maintain a directory of GIS training sources and opportunities	**MOD**	• Design on-line directory of training sources and events • Assign responsibility for maintaining directory • Promote use of directory and entry of new sources and opportunities • Keep directory current
E9	Explore and deploy emerging collaboration and professional networking tools	**MOD**	• Identify new tools and techniques for support for work collaboration, networking, and workflow automation • Select and test specific tools and technologies for GIS projects • Deploy and train users

Footnotes:

(1) Category: Organizational and management structure and practices (O); Data development or management (D); System configuration, software, or application development and operation (S); Education, outreach, and internal/external communications (E); Funding, budgeting, cost-benefit evaluation, and financial management (F); Legal or policy development and management (L)

4.3 PHASES AND TIMING FOR SDI IMPLEMENTATION

This section describes phases for SDI development, deployment and accomplishment of the SDI goals over a five-year period. This gives a general context of overall timing. Four phases will carry Idaho's SDI program from its current status to an operational level that substantially accomplishes the SDI vision. Table 7 describes the four phases.

Table 7: General Timing for SDI Development and Deployment

Phase	Projected Timing	Description	Key Milestones
Phase 1: Organizational Development and Technical Design	Jan. 2009 to Dec. 2010	Concentration on getting formal approvals and putting in place the proposed governance structure, augmentation of staff. Includes garnering sustained high-level support and sustained funding through additional budget allocations and partnerships. Technical design work includes definition of standards for Framework themes, database design, and assigning responsibilities and establishing procedures for development and ongoing maintenance. Also includes identification, design, and initiation of development for several critical GIS applications. Continue and expand outreach and communication with stakeholders and define structure for regional centers. Existing work in database and application development, Web-based services, and application development continue at their current or accelerated pace.	• Get formal approvals • Establish additional funding sources • Put in place SDI governance structure • Augment support staff • Finalize data standards and development procedures • Design and begin development of critical GIS applications • Define Regional Center structure and data stewards • Complete refinements to statewide NHD data
Phase 2: High-Priority SDI Development and Deployment	Jan. 2010 to June 2011	Continue to build partnerships, expand SDI participation, and secure funding sources. Make substantial progress or complete statewide development of critical Framework development including orthoimagery, cadastral/parcels, governmental units, and transportation. Complete development of critical GIS applications and initiate development of others. Put in place the Core Data and Services sites with enhanced "virtual SDI clearinghouse" approaches building on existing capabilities of INSIDE Idaho. Enhance outreach, education, and training programs for SDI stakeholders.	• Secure additional funding sources and partnerships for SDI development • Complete development and deployment of critical GIS applications • Complete statewide development of selected Framework themes (orthoimagery, road centerlines) and move into ongoing stewardship mode • Make substantial progress on statewide development other Framework themes (e.g., geodetic control, cadastral reference, parcels, governmental units) • Establish/formalize at least two Regional Centers • Establish Core Data and Services operations

Table 7: General Timing for SDI Development and Deployment

Phase	Projected Timing	Description	Key Milestones
Phase 3: Continued SDI Development and Deployment	July 2011 to Dec. 2012	Continue work on SDI partnership and outreach activities. Continue Framework development and make significant progress toward full statewide coverage for all Framework themes. Support efforts for development and integration of non-Framework data. Continue to enhance outreach and education programs.	• Maintain funding sources and partnerships for SDI development • Complete statewide development of selected Framework themes (cadastral reference, parcels) and move into ongoing stewardship mode • Make substantial progress on development of other Framework data (geodetic control, parcels, governmental units, elevation) • Establish/activate at least two additional Regional Centers • Enhance Core Data and Services operations
Phase 4: Full SDI Development and Deployment	Jan. 2013 to Dec.2013	All major SDI goals and implementation initiatives will be accomplished during this Phase. Sustained funding and high-level support will be achieved and there will be extensive participation from stakeholder groups throughout the state. Statewide Framework coverage will be in an ongoing maintenance mode, and GIS data access and related services will be enhanced.	• Maintain funding sources and partnerships for SDI development • Complete statewide coverage on most Framework data themes • Establish/activate additional Regional Centers

More specific information on the planned timing for implementation work is provided in Table 8.

Table 8: Planned Timing for Implementation Initiatives

ID Number	Implementation Initiative (organized by Category*)	Priority	Planned Start	Planned Finish	Current Status (work completed as of January 2009)
Organizational and Management Structure and Practices					
O1	Improve and clarify role and composition of IGC	**VH**	1/2009	6/2009	Not yet initiated
O2	Set up templates, practices, and procedures for overall plan monitoring and reporting	**VH**	2/2009	5/2009	Not yet initiated
O3	Set up templates, practices, and procedures for detailed work plan preparation and management	**VH**	2/2009	6/2009	Not yet initiated
O4	Refine and finalize formal procedures and policy for data standard development and approval	**VH**	2/2009	4/2009	Drafting initial guidance and template ,10%
O5	Establish and formalize state agency stakeholder coordination group	**VH**	1/2009	1/2009	Not yet initiated
O6	Support Formal legislative recognition of State CIO Office	**H**	9/2009	3/2011	Not yet timely
O7	Establish more formal geographic data sharing cooperative	**H**	8/2009	2/2011	Preliminary discussions and relationship building
O8	Explore and define options for providing GIS services to low-resourced jurisdictions	**H**	10/2009	8/2011	Not yet initiated
O9	Establish Regional Centers as part of SDI organizational structure	**H**	7/2009	12/2011	Not yet initiated
O10	Create "template" organizational structure and policies to support enterprise GIS development	**MOD**	4/2010	2/2012	Not yet initiated
O11	Reduce redundancy and duplication of similar data sets in government agencies	**MOD**	10/2010	12/2013	Ongoing process; unable to determine progress since extent of duplication not known
Funding, Budgeting, Cost-benefit Evaluation, and Financial Management					
F1	Business case and materials for promoting GIS	**VH**	2/2009	10/2009	Briefing paper completed with discussions about approach. 15% complete
F2	Review and re-introduce legislation for County Recorder fee	**VH**	3/2009	4/2010	Review and preliminary discussions.10% complete
F3	Seek state "base funding allocation" to support key SDI development	**VH**	1/2009	9/2011	Champions recruited and partnerships strengthening
F4	Identify and focus development on key business areas and "killer applications"	**VH**	2/2009	3/2010	Have conducted preliminary discussions and evaluation of existing applications that could serve as basis for SDI applications. 5% complete
F5	Explore, make recommendations for, and secure nontraditional funding sources	**H**	1/2009	9/2011	Not yet initiated

Table 8: Planned Timing for Implementation Initiatives (con't)

ID Number	Implementation Initiative (organized by Category*)	Priority	Planned Start	Planned Finish	Current Status (work completed as of January 2009)
Funding, Budgeting, Cost-benefit Evaluation, and Financial Management					
F6	Improve coordination of E911 funding mechanism	**MOD**	1/2009	1/2012	Statewide funding being arranged through 911 grants and funds for selected Framework datasets. Work ongoing for coordination of funding. 60% complete.
F7	Examine and confirm state purchase contracts and enterprise license agreements with specific GIS vendors	**MOD**	2/2010	5/2012	100% for current year; occurs annually
Legal or Policy Development and Management					
L1	Clarify and potentially amend state public records laws	**VH**	3/2009	7/2010	Not yet initiated
L2	Support formal legislative recognition of State CIO Office	**H**	9/2009	9/2009	Not yet timely—no active work initiated
L3	Seek state legislation as basis for stronger statewide SDI governance	**H**	3/2009	8/2010	Previewed to ITRMC. Less than 5% complete
L4	Develop, enhance, and approve formal policies, procedures, and practices	**H**	3/2009	11/2010	Several standards, policies, and guidelines are formalized. 50% complete.
L4a	Policy for SDI standards consensus and approval	**H**	3/2009	1/2010	Straw man draft in development.
L4b	Policy for statewide geographic data sharing (data cooperative)	**H**	9/2009	11/2010	Not yet initiated
L4c	Policy on SDI plan and project management and reporting	**H**	4/2009	6/2010	Not yet initiated
L4d	Agreements and formal procedures defining responsibilities and practices for Framework data stewardship	**H**	9/2009	11/2010	Not yet initiated
L5	Develop template database specifications and procurement templates	**MOD**	4/2010	12/2011	Not yet initiated
L6	Records Retention	**L**	8/2012	2/2013	Not yet initiated
Geographic Data Development or Management					
D1	Revise/reach consensus on Framework	**VH**	1/2009	10/2009	75% complete
D2	Process results from IACA parcel needs survey and develop conclusions	**VH**	1/2009	5/2009	Results released 12/08; examination just beginning
D3	Examine and resolve boundary problems with Census enumeration areas	**VH**	1/2009	4/2010	Discussions held but active work not yet initiated
D4	Complete development of Framework data	**VH, H**	1/2009	12/2013	About 15% complete (taking into account estimated time and cost for all Framework Themes). See Section 4.4 for more information cost estimates.

Table 8: Planned Timing for Implementation Initiatives

ID Number	Implementation Initiative (organized by Category*)	Priority	Planned Start	Planned Finish	Current Status (work completed as of January 2009)
Geographic Data Development or Management					
D5	Formalize long-term program and sustained support for Orthoimagery enhancement	**H**	1/2009	10/2009	90% complete for 2009 cycle. Little work done for long-term program set-up
D6	Designate responsibilities and develop procedures for Framework data stewardship	**H**	3/2009	7/2010	Small group identified
D7	Improve approach and tools for notification of database updates and for easy search and discovery of the current authoritative source	**H**	3/2009	5/2010	Not yet formally initiated but ongoing work at INSIDE Idaho supports this effort
D8	Encourage and coordinate capture and management of data to support public safety response	**H**	3/2009	9/2010	Work is ongoing at the state and local level with significant progress.
D9	Reduce redundancy and duplication of similar data sets in government agencies	**H**	12/2009	3/2013	Ongoing work and progress by individual stakeholders but not formalized as part of the SDI program.
D10	Establish more formal geographic data sharing cooperative	**H**	8/2009	2/2011	Not yet initiated
D11	Update Idaho metadata profile and develop more effective metadata management tools	**H**	3/2009	9/2010	Not yet initiated
D12	Establish Web-based service for input of and access to information on qualified survey control and monumentation	**H**	12/2009	2/2011	Discussions of existing options – 5%
D13	Define long-term approach for resolution of problems with governmental boundary placement	**H**	5/2009	12/2010	Technical discussions ongoing – 10%
D14	Create index of Web-based geographic data sources and services	**H**	1/2009	12/2010	About 20% complete by INSIDE Idaho.
D15	Develop template database specifications and procurement templates	**H**	6/2010	10/2011	Not yet initiated in a formal manner but individual stakeholder organizations have mature design and procurement documents that could be used.
D16	Promote use of the single state coordinate system and deploy tools for effective software use	**MOD**	3/2009	9/2010	Ongoing; survey statute being revised to include IDTM coordinate system. 85% complete
D17	Provide guidance for non-Framework database development	**MOD**	12/2009	10/2013	Not yet initiated
D18	Explore and design approach for archiving and management of historic data	**L**	7/2011	6/2013	Not yet initiated
System Configuration, Software, or Application Development and Operation					
S1	Improve INSIDE Idaho support and services	**VH**	1/2009	4/2011	Not yet formally initiated also incremental improvements are being made on a regular basis.

Table 8: Planned Timing for Implementation Initiatives

ID Number	Implementation Initiative (organized by Category*)	Priority	Planned Start	Planned Finish	Current Status (work completed as of January 2009)
System Configuration, Software, or Application Development and Operation					
S2	Complete data standards for Framework themes	**VH**	3/2009	2/2011	Drafting guidance and template. About2% complete
S3	Identify, design, and develop key enterprise GIS applications	**VH, H**	3/2009	12/2009	Several key applications identified (see Appendix B) and substantial work done by individual stakeholders that could be used as basis for SDI enterprise applications.
S4	Encourage and support Improved statewide wide area network communications	**VH**	1/2009	7/2010	IGO mapping existing broadband infrastructure and playing general role as advocate for improvements.
S5	Move toward statewide 'virtual portal" for Web-based access to spatial data and services	**H**	10/2009	1/2012	Preliminary discussion of options and emerging technologies
S6	Complete development of and deploy integrated property records system (IPRS)	**H**	1/2009	7/2010	Data gathering nearly complete (except ITD ROW); data reconciliation ongoing; application development progressing slowly - 60%
S7	Negotiate and put in place an enterprise license agreement for GIS software	**H**	5/2009	2/2010	Preliminary discussions underway. 5% complete.
S8	Work with IT staff to examine server HW in state government and move toward server consolidation	**H**	5/2009	6/2010	Planning discussions underway – 20% complete within OCIO.
S9	Create index of Web-based geographic data sources and services	**H**	1/2009	12/2010	Initial compilation complete; INSIDE Idaho requesting new listings from statewide community on an ongoing basis – 50%
S10	Integrate GIS with "non-GIS" systems and databases	**MOD**	2/2010	5/2012	No formal effort initiated but significant progress by individual stakeholders.
S11	Explore new application technologies and recommend adoption as appropriate	**MOD**	2/2010	12/2013	No formal approach in place but individual stakeholders continue to monitor technology.
S12	Monitor and exchange information on industry trends and developments	**MOD**	2/2010	12/2013	Same as S11
S13	Continue to monitor and identify opportunities for new applications of GIS technology	**MOD**	2/2010	12/2013	Same as S11
S14	Design and move toward server-centric model for GIS	**L**	1/2011	4/2013	Not yet initiated in a formal manner but individual GIS technical staff in stakeholder organizations are evaluating options.
S15	Develop guidelines for system administration and security for GIS configurations	**L**	5/2011	4/2013	Not yet initiated
Education, Outreach, and Communications					
E1	Prepare SDI "Communications and Promotion Plan", execute and monitor actions	**VH**	3/2009	5/2009	Not yet initiated.

Table 8: Planned Timing for Implementation Initiatives

ID Number	Implementation Initiative (organized by Category*)	Priority	Planned Start	Planned Finish	Current Status (work completed as of January 2009)
Education, Outreach, and Communications					
E2	Engage and recruit participants for the newly formed Idaho Geospatial Council	**VH**	5/2009	4/2011	Not yet formally initiated.
E3	Actively pursue outreach with professional and industry associations	**H**	7/2009	1/2011	Assessor and surveyor communities engaged in Framework; 2009 Imagery partnership provides ramp to greater participation – 15%
E4	Create and maintain a GIS-enabled directory of GIS contacts and personnel around the state.	**H**	7/2009	12/2011	Not yet initiated
E5	Establish Regional Centers as part of SDI organizational structure	**H**	11/2009	10/2010	Not yet initiated
E6	Prepare GIS education/ training plan and put in it in place	**H**	3/2010	10/2011	Not yet initiated
E7	Provide better access to educational materials and professional networking	**MOD**	3/2010	7/2012	Not yet initiated
E8	Compile and maintain a directory of GIS training sources and opportunities	**MOD**	3/2010	12/2013	GISleuth.com now performing this function
E9	Explore and deploy emerging collaboration and professional networking tools	**MOD**	3/2009	5/2009	Gradual improvements made during 2008. 15% complete.

4.4 HIGH-LEVEL BUDGET PROJECTIONS

SDI development will require significant monetary expenditures and allocation of staff resources over the five-year period of the Strategic Plan and for ongoing operational support. It is in the interest of all stakeholders to find ways to allocate funding and internal resources for the effort so as not to delay the full benefits. Table 9 summarizes the main categories of funding and presents the projected total cost. Appendix D provides more detail on these cost projections. They reflect current or future in-house staff costs and projected contracted services and vendor purchases. As indicated in Appendix D, approximately 40 percent of this projected total cost of about $26.7 million is already planned or budgeted for future years by federal and state agencies whose missions are tied to one or more Framework datasets. A significant portion of the investment in Framework development and stewardship and the regional centers will flow to local governments.

Table 9: Summary of Five SDI Development Cost Projections (see Appendix D for details)

SDI Implementation Cost Category	Explanation	5-Year SDI Cost Projection
Augmented staff and operational budget for IGO	Cost for additional staff and office operational costs for SDI leadership, management, and technical coordination	$431,000
IGC Operational Support	Administrative, meeting, and travel costs to support the work of the newly formed Idaho Geospatial Council and its Executive Committee	$52,000
Outreach, Communications, Promotion	Support for SDI communications, preparation of promotional materials, meetings, events, and other work to support participation by and coordination of SDI stakeholders	$44,500
Framework Database Development and Stewardship	Statewide development of Framework data themes including contractor costs and in-house staff resources.	$23,664,000
Regional Center Development and Support	Costs to support planning, organization of an ongoing operation of Regional GIS resource centers.	$510,000
Computer Hardware, Software, Network Infrastructure	Acquisition and upgrade of computer hardware, GIS software, and network infrastructure that specifically addresses SDI development (for IGO and special SDI projects)	$50,000
Training/Education	Costs for planning and coordinating GIS education and training and support for ongoing work in developing training programs and providing services to the SDI community.	$385,000
GIS Application Development and Deployment	Costs for the development of custom GIS applications or GIS integration to support SDI operations and stakeholders.	$900,000
INSIDE Idaho Enhancement/Virtual Portal Development and Operation	Costs for enhancement of current INSIDE Idaho services and for development of virtual portal Web service.	$675,000
	TOTAL:	**$26,711,500**

4.5 FUNDING AND FINANCING STRATEGIES

Cost projections presented above show projected total five-year costs for SDI development and operation will be approximately $26.7 million. Where will these substantial funds come from? Several SDI implementation initiatives address the need to explore and secure funding and financing approaches for SDI development and operation. Two key funding strategies will be important for the success of SDI development:

- Better leveraging of funds currently expended by federal, state, and local agencies to support SDI goals: Tens of millions of dollars are already expended annually in Idaho for geospatial data and system development. Lack of standards and insufficient collaboration mean that some of this development work does not result in sharable or accessible information. The coordination structure and consensus standards established through the SDI will ensure that current investments are used to their full benefit.

- State government budget allocations: SDI development will require state general fund and special allocations for specific development areas for which direct value, costs savings, and other benefits can be projected.

In addition, there are "innovative" funding and financing mechanisms that have been used successfully for GIS and information technology initiatives which could be used for financing Idaho's SDI. Some references that explain these funding sources and financing strategies are:

- CDG (2003). Pay IT Forward: Doing the Public's Business with Digital Technologies while Reducing Pressure on the General Fund, Center for Digital Government, Government Signature Series
- Croswell, Peter and Alex Wernher (2004). GIS Program Revenue Generation and Legal Issues in Public Sector Organizations, Quick Study publication from URISA
- Gamble-Risely, Exec Editor (2003). Essential Partnerships: A guide to the Successful Creation of the Public-Private Partnerships, special publication of the Center for Digital Government and Center for Digital Education
- Intergovernmental Advisory Board (1998). Innovative Funding Approaches for Information technology Initiatives, special publication prepared in cooperation with the Federation of Governmental Information Processing Council and the U.S. General Services Administration
- Joffe, Bruce (2005). Ten Ways to Support GIS Without Selling Data, URISA Journal, Vol. 16, No. 2, p 27-33
- NASCIO (2008). Innovative Funding for Innovative State IT: Models Trends & Perspectives, special publication from the National Association of State CIOs, September, 2008
- Thomas, Christopher (2006). "Innovative Funding Sources," Proceedings of the 2006 Annual URISA Conference

The funding sources and financing strategies which offer real opportunities for Idaho and which avoid the pressure on annual general fund budget allocations are listed below and are explained in more detail in Appendix E:

- Allocation from Non-General Fund Budgets or Special Funds
- Joint Funding/Project Partnerships with Outside Organizations
- Data Licensing or Subscriptions
- Special Transaction Fees
- Grants
- Bonds
- User Fees
- Standard Public Project Fee or Assessment
- Service Agreement to Support Major Infrastructure Development
- Advertising/Promotion/Sponsorship

- Royalties for Value-added GIS Products
- Reassignment of Unused Funds (aka “diverted reversion”)
- Sale of Intellectual Assets
- Cost Savings or Offset through Staff Resource Sharing/Nontraditional Staff Use
- Gain Sharing (aka “benefits funding”)
- Computing Infrastructure Sharing

4.6 SUMMARY OF RESOURCE NEEDS

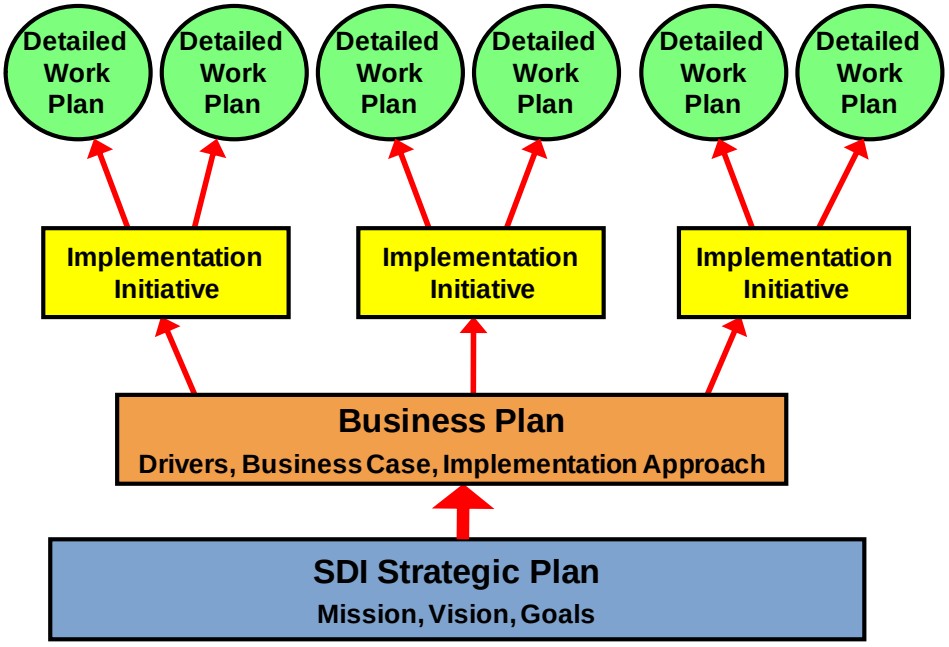
SDI development will require substantial funding and a commitment of staff by all stakeholder groups. The total five-year cost projection of $26.7 million is realistic and includes significant funds which are already budgeted or allocated by public agencies. There are multiple opportunities and strategies that can and will be pursued for securing additional funding for SDI initiatives—all of which can be justified based on their support for business requirements of stakeholder groups. It should be noted that progress on SDI implementation initiatives is dependent, in large part, on actively engaged professionals that are part of Idaho’s GIS user community. The work of a growing group of people, coordinated through the SDI program, is vital for accomplishing the SDI goals.

5. IMPLEMENTATION MANAGEMENT AND MONITORING

5.1 MANAGEMENT STRUCTURE, IMPLEMENTATION APPROACH, AND RESPONSIBILITIES

The success of the SDI development work called for in this Business Plan is dependent on an effective management structure, project planning and management, and clearly defined roles. As illustrated in Figure 7, it is critical to maintain the relationship between the implementation work, the strategic goals from the Strategic Plan, and the business drivers from the Business Plan. This Business Plan identifies a series of implementation initiatives each of which requires a detailed work plan with assigned resources and a specific schedule.

Figure 7: Relationship between Strategic Plan, Business Plan, and Detailed Work Plans for Implementation Initiatives



Participants in SDI development will be drawn from the entire SDI leadership and stakeholder community, including the Idaho Geospatial Office (IGO), the current Idaho Geospatial Committee and the to-be-formed Idaho Geospatial Council and its Executive Committee (IGC), the ITRMC, senior management in stakeholder organizations, GIS users in all stakeholder organizations, and private contractors. Preparation of detailed work plans will specifically identify roles at the task level for these participants as shown in Table 10.

Table 10: Participants and Roles in SDI Development

	Participants in SDI Development (L=Lead Role, S=Secondary or Support Role)											
Main Roles in SDI Development	**Idaho Legislature**	**Governor/Senior Executives**	**ITRMC**	**IGO**	**IGC Leadership (1)**	**IGC members and Working Groups(1)**	**Regional GIS Resource Centers AND User Groups**	**INSIDE Idaho**	**GIS Managers and Experts in Stakeholder Organizations (2)**	**GIS Users (3)**	**Product Vendors (4)**	**Contractors/Consultants (5)**
High-level SDI authorization and approval	**L**	**L**	**L**									
Allocation and assignment of resources for SDI implementation	**S**	**L**	**S**	**S**	**S**							
SDI promotion, education, and communication			**S**	**L**	**L**	**S**	**S**	**S**	**S**			**S**
Finding and securing funding and resources	**S**	**L**	**S**	**L**	**L**	**S**			**S**			
Overall progress tracking and work coordination		**S**	**S**	**L**	**L**	**S**			**S**			
Preparation of work plans and project organization				**L/S**	**S**	**L/S**	**S**	**L/S**	**L/S**			
Implementation project management and monitoring				**L/S**	**S**	**L/S**	**S**	**L/S**	**L/S**			
Project implementation work (participation as project team members or support in implementation)				**L/S**	**S**	**L/S**	**S**	**L/S**	**L/S**	**S**	**S**	**S**
Review and comment on implementation work				**L/S**	**L/S**	**S**	**S**	**S**	**S**	**S**		**S**
Provision of products and ongoing contracted support				**S**		**S**			**S**			**L**

(1) IGC refers to both the current Idaho Geospatial Committee and the recommended Idaho Geospatial Council and its Executive Committee. "IGC Leadership" refers to the IGC Chair and officers and the Executive Committee of the recommended Geospatial Council

(2) Includes GIS management personnel and technical staff in all stakeholder organizations participating in SDI development (e.g., federal, state, local government; regional agencies; tribal governments, universities, utility organizations, etc)

(3) All users and potential users of GIS technology or the resources available through the SDI. These users are the main recipients of the results of SDI development and some may be directly involved in implementation by providing information or in a review/comment role.

(4) Private companies providing products needed for SDI implementation (e.g., software, computer hardware) and associated services for installation, maintenance, and technical support

(5) Private companies or other parties providing contracted services for SDI implementation including database development, consulting, application development, and training

5.2 RISK MANAGEMENT

Risk management is an accepted practice used in any major implementation initiative, and it should be a part of the work carried out under the implementation initiatives presented in this Business Plan. Risk management is a strategy and set of techniques to help prepare for and respond to certain types of changes or events that could negatively impact an implementation. This section provides a general risk management approach that applies, at a high-level, to the overall SDI implementation. Risk management techniques should also be applied at a more detailed level in the Work Plan preparation for specific implementation initiatives and the management of those implementation activities. Risk Management has three main parts: risk identification, risk impact assessment, risk response planning.

5.2.1 Risk Identification

Risks associated with SDI development are those conditions or events that could impact work toward SDI strategic goals—by delaying work completion, reducing quality, increasing costs, or disrupting organizational coordination of SDI participants. Potential risks of main concern to the SDI: financial, organizational, and technical. Table 11 explains these risks.

Table 11: Overview of Types of Risks

Risk Type and Explanation	Examples of Specific Risks
Financial Risks Includes risks associated with allocating and sustaining funding and resources for SDI implementation work. This includes internal decisions inside the organization that impact funding streams, external economic changes that impact resources available for SDI, and potential problems with implementation planning or management resulting in over budget projects.	• Insufficient internal funding allocation or funding diverted to other projects • Expected external funding does not materialize • Dedicated staff resources not sufficient • Cost projections do not meet actual costs • Poor contractor performance results in increased costs
Organizational Risks Includes risks that have their source in organizational, political, or legal aspects of SDI development. This includes all aspects of organizational relationships, management, staff assignments, governance structure, high-level legislative and executive support, legal and policy rulings, and all types of political and media influences on SDI implementation work.	• Expected legislative support is not provided • Lack of sufficient senior executive awareness and support • Expected level of participation from stakeholder groups is not delivered • Administrative delays in personnel actions and policy approval • Organizational/legal obstacles in forging formal partnerships • Contract discrepancies impact timing and quality of contracted work • Poor management and coordination creates delays and obstacles to consensus • Political battles reduce level of collaboration and joint project participation

Table 11: Overview of Types of Risks (con't)

Risk Type and Explanation	Examples of Specific Risks
Technical Risks Includes risks associated with the technological and operational aspects of the GIS program or project, including hardware and software, network configuration, and database development, security breaches, and the procedural workflows associated with technology acquisition and implementation. These risks reflect potential technical obstacles in system development that could impact costs or the schedule.	• Delays in forging technical standards to be used as basis for development work • Problems with software or hardware installation and configuration, or functionality • Insufficient technical staff and skills for required implementation work • Problems with source materials or techniques used in database development • Network communication performance limitations impact access to data and services

5.2.2 Risk Impact Assessment

Risk impact assessment is a process for assessing the likelihood of a risk event and its impact on the SDI implementation. Its purpose is to give managers a way to anticipate risk and assign priority as a basis for taking appropriate action. SDI risks, explained in Table 11 above, could impact one or more of the following: nature of the potential impact on the GIS program or project. The most common types are:

- Monetary cost or resources: impacts on the anticipated (planned or budgeted) monetary cost, staff levels, or other tangible resources for the project or program.
- Schedule/Timing: impacts on the planned schedule and timing for completion of deliverables or milestones
- Work Scope and Services: impacts on the nature, volume, contents, specifications, etc. of the products, services, and results planned for a project or defined for a GIS program
- Quality of Work and Deliverables: impacts on quality of products and services which may relate to accuracy, amount of error, reduced performance (e.g., GIS application), etc.

Risk impact assessment involves assigning a level of likelihood of the occurrence of a potential risk event and a severity level that gives a gauge on how much impact the event could have on cost, schedule, scope, or quality. While in some cases, it is possible to assign numeric measures to risk likelihood and severity, the more realistic approach for most SDI implementation initiatives is to use qualitative scores (e.g., High, Moderate, Low). This usually gives a sufficient indication of risk potential and impact to support risk response planning.

5.2.3 Risk Response Planning

The risk identification and risk analysis described above is the basis for monitoring risk events and taking appropriate action by applying specific risk response practices. The

Project Management Institute and other sources define three major risk response strategies:

- Avoidance: Adjusting a project plan (e.g., reducing schedule or scope) or resources (using alternative staff resources or funding sources) when risk events become evident, to avoid the risk or isolate its impacts.
- Transference: Transferring the consequences or responsibility of a risk to a third party. Transference does not eliminate a risk; it only shifts responsibility. The most common strategy for risk transference is through well-designed contracts for certain elements of the work.
- Mitigation: Reduction in the probability and/or consequences of an adverse risk event to an acceptable level. Usually includes project controls for identifying risk events early in a project and taking formal action before impacts are great.

Risk response approaches should be specifically identified as a part of detailed work planning for specific implementation initiatives. At a general level, there are well-accepted project management practices that make use of the three risk response strategies:

- Prepare detailed and realistic work plans that clearly define tasks, deliverables, and schedule and use these plans as a basis for executing and monitoring work
- Establish effective project status monitoring and quality review procedures for tasks and deliverables. Use this monitoring as a basis to identify possible problems (with scope, schedule, or quality) early in the process so that corrective action can be taken
- Assign competent and well-trained project management and team members
- Use contractors effectively (as a risk transference strategy) but ensure that contract specifications, performance requirements, and legal terms are clear to all parties
- Build sufficient slack time into the project schedule to allow for adjustments to timing should delays occur
- Investigate and have options for alternate sources of funding and staff resources that can be tapped if committed resources are reduced
- Get formal commitments (written agreements or project charter) for organizations participating in an implementation initiative

5.3 MONITORING AND REPORTING ON PROGRESS

SDI development should be accompanied by regular tracking and reporting of development status. This includes the tracking of progress against strategic goals and individual implementation initiatives. Procedures for status monitoring and reporting are discussed in this section.

5.3.1 Strategic Goal Monitoring and Reporting

Goal monitoring and reporting is a high-level SDI management activity that gives a picture of general progress on SDI development. The result will be a "Strategic Plan Progress Report" prepared on a quarterly basis. The report will be formally prepared for the ITRMC but distributed to all project stakeholders and posted for Web access. The report summarizes activities relating to each goal with summary remarks about overall progress and critical issues. The report will follow a format like that shown in Exhibit A.

Exhibit A: Suggested Format for Strategic Plan Progress Report

IDAHO SDI-STRATEGIC PLAN PROGRESS REPORT

Submitted by: xxxxx

Submitted to: xxxxxx

Submittal date: xx/xx/20xx

Report period: xx/xx/20xx to xx/xx/20xx

Summary of Overall Progress:

Xxxxxx xxxx x xx xxxxx x xxx xx xxxxxxx xxx xxxxxxxxx x xxx xxxx x xxx xx xxxx x xxx xx. Xxxxxx xxxx xxxxxx x xx xxx xxxxxxx xxx xxxxx xxx xxxxx xxxxx xxx x xxx xxx xxxxxxx xxxxxx xx xxxx xxxxxxxxxx x xxx.

Summary of Progress Against Goals:

Goal 1. Develop a strong business justification to cultivate high-level support and sustained financing for the SDI.

- Xxx
- Xxx
- xxx

Goal 2. Implement an improved SDI management and coordination structure with appropriate legislation, policies, and management practices that supports full SDI development and its ongoing operation.

- Xxx
- Xxx
- xxx

I

I [Goals 3 to 8]

I

Goal 9. Maintain current knowledge about GIS and information technology trends and industry offerings to take advantage of new products, tools, and practices.

- Xxx
- Xxx
- xxx

Important Issues:

Xxx xxxxx xxxx xxxxx xx x xxxxx xxxxxxxxxx xx xxxxxxxxxxx xxx xxx xxxx xxxxxxxxxxx xx xxx x xxx xxxxx xxx. Xxx xxxxxxx xxx xxx xxxxxxx xxxxx xx xxxx xxxxxxxxx x xxx xxxxx xxxxxxxx xx xxxxxx xxx xxx

These quarterly Strategic Plan Progress Reports are completed by the State's GIO. This requires an efficient bottom-up communication process in which information on specific implementation work is reported on a regular basis. The SDI Implementation Status Report, discussed below, provides information for completion of these quarterly reports.

5.3.2 Monitoring and Reporting of Implementation Initiatives

This is a more detailed reporting, referred to as the "SDI Implementation Status Report" that captures summary status information about work being carried out for implementation initiatives in this Business Plan. The intended audience for these reports is management personnel directly involved in SDI development oversight, project managers and team members, IGC members, and other stakeholders who are actively engaged in implementation work. These reports will be prepared on a quarterly basis, or more frequently if desired, using information provided by project teams and individuals assigned responsibility for work under specific implementation initiatives. The format shown in Exhibit B will be used.

Exhibit B: Suggested Format for SDI Implementation Status Report

IDAHO SDI IMPLEMENTATION STATUS REPORT

Submitted by: xxxxx
Submitted to: xxxxxx
Submittal date: xx/xx/20xx
Report period: xx/xx/20xx to xx/xx/20xx

Summary of Progress on Implementation Initiatives: Xxxxx xx xxxxxxxx xx x xxx xxxxxxxxxxx xxxxx xxxxx xxxx x xxxx xxxxx xxxx xxxxxxxxxxx xxx. Xxxxxxx xx xxxxxx xxxxxxxxxxxxx xxx xxxxx xxxxx xxxxxx x xx xxxxx xxxx xx xxx x xx xxx xxxxx xxx xx xx x xxx

IMPLEMENTATION INITIATIVES	Plan Start	Plan Finish	Actual Start	Actual Finish	Percent Complete	Comments
Organizational and Management Structure and Practices						
O1: xxxxxxxxx						
Ox: xxxxxxx						
Funding, Budgeting, Cost-benefit Evaluation, and Financial Management						
F1: xxxxxxxx						
Fx: xxxxx						
Legal or Policy Development and Management						
L1: xxxxxxxxx						
Lx: xxxxxxxx						
Geographic Data Development or Management						
D1: xxxxxxxxxx						
Dx: xxxxxxxxxxxx						
System Configuration, Software, or Application Development and Operation						
S1: xxxxxxx						
Sx: xxxxxxxxx						
Education, Outreach, and Communications						
E1: xxxxxx						
Ex: xxxxxxxxx						

5.3.3 Tools for Monitoring and Reporting

Compiling the Quarterly Strategic Planning Reports reporting will use software packages that are part of the Microsoft Office suite—including Word, Excel, and Project. The Strategic Planning Report will be prepared as a Microsoft Word document. The SDI Implementation Status Report will use a combination of Microsoft Project and Excel. A Microsoft Project file accompanies this Business Plan. This file has been created with custom views for tracking and reporting progress. Information from the Project file may be exported to an Excel spreadsheet for creation of reports like that shown in Exhibit B.

5.4 MARKETING AND OUTREACH APPROACH

Continual, sustained communications and outreach activities are critical for accomplishing SDI goals. A fundamental tenet of the SDI is coordination among GIS users and maintaining awareness of and support from senior officials. Implementation Initiative E1 calls for the preparation of a "Communications and Promotion Plan" that defines all marketing, outreach, and communication activities. This "Communications and Promotion Plan" helps coordinate a variety of activities called for in this Business Plan.

The purpose of promotional activities is to increase the awareness and understanding of, support for, and participation in the GIS program and the services it provides. In essence, a GIS promotional campaign mixes education with a certain amount of advertising to connect with stakeholders and generate interest while conveying real information about GIS technology applications and benefits. In addition to promotion of the GIS program, there is an ongoing need to keep in contact with the user community, provide technical support, and to offer assistance in training and professional development. There are many approaches and communication elements that may comprise a successful promotional campaign including:

- Descriptive Information and Links: Information that describes and explains the GIS program and its services and products at summary and detailed levels. This includes various text and presentation pieces (brochures, guides, presentation materials) that can be accessed on-line or distributed in hard copy form.
- News and Status: Continuing information about the GIS program status and activities, and about the GIS community as a whole. This includes on-line posting information about major events, milestones, and the accomplishment of the GIS program.
- Professional Development: Education and training opportunities sponsored or coordinated by the GIS program or by other coordinating organizations.
- People Directory Information: Contact and profile information about the user community that the GIS program services and appropriate links to external contacts to support professional networking and the coordination of participants and parties interested in GIS.

- User Support: How-to information and specific user technical assistance and help relating to use of GIS software and applications, access to data, etc.
- Project Information and Support: Detailed information about specific projects sponsored or coordinated by the GIS program and tools supporting coordination and group collaboration for project work.
- Vendor Opportunities: Information about business opportunities for product and service vendors about competitive procurements for work supporting GIS projects and operations. Announcements and formal communications about RFPs, RFQs, etc., would need to be handled through appropriate procurement offices, but the GIS program could provide summary information and links to announcements and detailed information on procurement opportunities.

An important part of GIS program promotion is the concept of "branding"—a marketing term that refers to the creation of an identifiable name and symbol that represents the GIS program. Specifically, it involves the creation of a name or acronym, effective logo, slogan, and similar marketing devices and the use of these in all appropriate venues and channels. The purpose is to capture the attention of people and induce them to find out more—leading to participation and support.

GIS program branding is supported by the creation of a number of explanatory, promotional information items including such things as: a) brief single or two page brochure or flyer available in hard copy form and accessible via the Web, b) Web page with easily accessible information about the GIS program including mission statement and goals, c) more detailed descriptive documents about GIS program resources and services. Also, access to formal documents such as strategic plans, charters, etc. is important. The brand can be further communicated by various promotional strategies and "gimmicks" such as:

- Affix the logo and slogan to all appropriate materials, Web site, and information delivery channels
- Create icons that can be used symbolizing specific initiatives or products of the GIS program, and use these icons for communications and identification
- Prepare a music intro or sound cues that could be used in presentations. This would be a short but memorable "sound bite" that, after some use, people would associate with the GIS program.
- Produce and stock some appealing "promotional trinkets" with the GIS program logo (e.g., buttons, luggage tags, zipper pulls, compass balls, bookmarks, mouse pads, etc.) and give these away at GIS events. Avoid selecting expensive items but choose ones that will be appealing to the audience and which would likely be used in environments where they would receive additional exposure. Explore the possibility of vendor sponsorships to pay for these items.
- Devise an award/recognition program—perhaps in association with other GIS organizations or bodies in which people or organizations can be formally recognized for accomplishments that contribute to the GIS program and user

community. Conduct award ceremonies in conjunction with special events and use other communication channels to promote the awards programs and the recipients.

- Use multiple communication channels for distribution of information about "people and applications." This could include brief articles that highlight GIS applications of interest, as well as "profiles" of GIS professionals on staff and among the user community.

Successful communication with the GIS community is dependent on selecting and using effective "channels" and delivery mechanisms. Take all opportunities to conduct briefings and education programs to local and regional groups and events. Some effective channels and mechanisms that can be valuable for GIS program outreach and promotion include:

- Presentations and Briefings at Organization Meetings
- Presentations at GIS and Professional Events
- Training and Education Sessions
- Content Search Tools and Applications
- Web Page, Web Portal Delivery
- Email Broadcast or Push
- Publications
- Sponsorship of or Participation in Special Events
- Press/Media Releases
- Exposure via Professional and Business Associations
- User Help Tools
- Collaboration Tools for Project Teams

A general outline for an SDI Communications and Promotion Plan is shown as follows:

- Characterization of the SDI and its goals
- SDI "Branding" and identification of and promotional elements
- Characterization of SDI stakeholder community, decision makers, and "customers"
- GIS products, services, applications and their benefits to users
- SDI information and promotional pieces and media tools
- Communication channels and mechanisms and how to use them
- Promotional devices and events
- Communication and promotional actions, timing, and roles

APPENDIX A: EXAMPLES OF GIS BENEFITS

APPENDIX A: EXAMPLES OF GIS BENEFITS

GIS technology has been successfully deployed at the state, regional and local level for over 20 years. Experiences from many government and private sector organizations throughout the country reveal wide-ranging tangible benefits that have resulted from GIS deployment. This is a small sample of tangible, documented benefits that have been realized by hundreds of public sector organizations in the USA.

- A large number of state and local government agencies with manual mapping operations have seen staff productivity gains of over 2:1 through the use of GIS for map update operations. This result is a significant impact for environments with high-volume map changes (transportation networks, parcels, utility networks). For enterprise GIS programs in which duplicative mapping operations (in multiple departments) have been consolidated, staff productivity savings have ranged from 3:1 to over 8:1.
- Multiple local government planning and zoning offices have reduced hundreds of staff hours in manual work involved in identifying property owners and mailing notification letters for proposed zoning and land use actions. This is an example of a benefit that many public sector agencies have achieved in the area of resident location and notification which is applicable for a range of applications pertinent to government organizations (e.g. permit actions, emergency notifications, water rights cases, etc.)
- Two southern states have used GIS to investigate and reduce fraud in the Food Stamp program through correlation of the locations of Food Stamp recipients and stores redeeming Food Stamp debit cards.
- Several cities have used GIS in legal disputes involving traffic accident claims for damages based on poor traffic signage for which the cities were responsible. Information in the GIS sign inventory database established that signage was in place and in good condition. This helped avoid potentially huge claims for damages and injury.
- A county government in the mid-south used GIS to support its mosquito control program. GIS helped support planning and application of chemicals resulting in almost $20,000 in annual savings (contract labor and materials).
- A state agency used updated high-resolution imagery to support its levy of a mine safety enforcement fine for violations. The imagery helped establish a disputed date for mine conditions in a specific area of the surface mine operation. This helped cut short a more time-consuming and expensive process for documenting the enforcement action and potentially avoided a decision to reduce the size of the fine or eliminate it.
- After deploying Web-based GIS applications, multiple government agencies in the USA have documented significant reduction (up to 50%) in visits by people

needing parcel maps and related information—with a significant reduction of labor time to service these requests.

- Multiple town and county assessor offices have used a parcel-based GIS to help identify incorrectly appraised parcels and parcels not on the tax rolls. This has resulted in more equitable and consistent appraisals and significant increases in property tax revenue
- A west coast city used GIS to speed up the review of land development proposals and resulting decisions resulting in a savings of over $4 million (staff time cost avoided) annually and much quicker response to developers and information provided to land owners
- When a tornado came through a medium-sized city in the mid-south region and destroyed a large number of city-owned trees, up-to-date GIS tree-inventory data was used to document an insurance claim. The GIS provided sufficient information for claim approval, and the City realized a claim amount that was more than $150,000 above the standard amount that the insurance company had originally planned to offer.
- Over the past ten years, many local government emergency services agencies have combined GIS with emergency dispatch systems. Mapping capabilities integrated with E911 and vehicle location technology has greatly improved response to incidents and the improved response time has resulted in reduced loss of property and life.
- A large eastern seaboard city in the USA used GIS technology to plan improved solid waste collection routes and quickly realized savings of over $1million through reduction in overtime pay.
- Several public wastewater utilities have used GIS to help identify customers omitted from the billing system resulting in significant increased fees, including tens of thousands of dollars of back-billing for unpaid fees and significant annual increases in ongoing revenues from monthly bills.
- A state agency in charge of school busing for local school districts used GIS to plan optimal bus routes and reduced, by hundreds, the number of buses needed, and realized other tangible benefits: a) thousands of driver hours, b) millions of reduced miles driven annually, c) over a million gallons of fuel savings annually.
- A western state, working with the Bureau of Land Management, used GIS to evaluate public land holdings and to evaluate approaches for consolidation and exchange of parcels in reserve areas. The result improved federal land management operations, and the parcel transfer resulted in hundreds of millions of dollars in revenue to the state.
- A county government in the southeast used digital terrain data and other GIS data sets to evaluate sites for economic development. A company proposing a major commercial development facility asked the county to conduct site evaluation and survey work as a precondition for site selection. The GIS data was sufficient in

quality and detail to avoid on-site work resulting in a savings of $140,000 that would otherwise have been spent.

- The public health agency of a western state used GIS to geographically analyze demographic information and health services statistics to evaluate allocation of health services and to identify overserved and underserved areas. The project generated maps and supporting information that resulted in more efficient use of staff resources and addressed needs of citizens in underserved areas.
- A small city in the mid-south region used GIS addressed-based data and jurisdictional boundary data from their GIS to examine the location of vehicle owners inside the city who are required to pay a vehicle sticker fee. The analysis revealed a large number of vehicle owners, previously identified as being in unincorporated areas of the county, who were actually city residents. This resulted in an annual revenue increase of over $50,000.
- A number of local governments have used GIS to track and map scheduled development projects involving subsurface infrastructure and paving. This information has provided a basis for coordination of work between government departments and contractors to avoid multiple street excavations.

APPENDIX B:
HIGH-PRIORITY GIS APPLICATIONS FOR POTENTIAL EARLY DEPLOYMENT

APPENDIX B: HIGH-PRIORITY GIS APPLICATIONS FOR POTENTIAL EARLY DEPLOYMENT

Table B1: Candidate High-Priority GIS Applications for Early Development

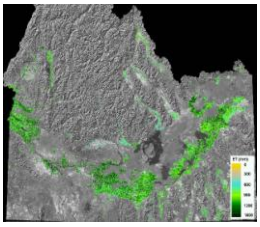
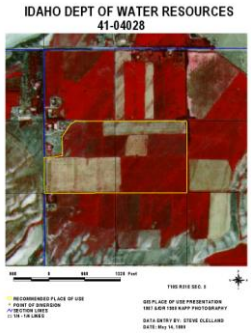
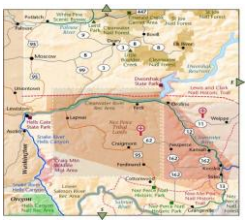
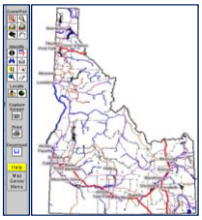
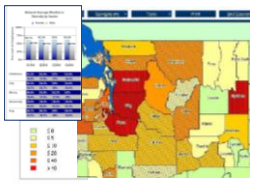
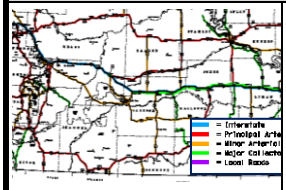
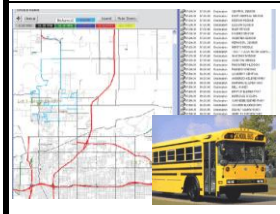
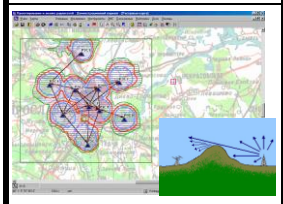
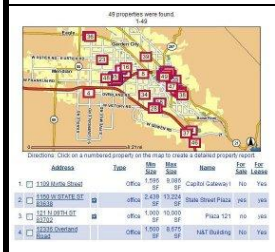
Application		Description and Impact
	**Water Use and Conservation Analysis**	Build on existing GIS use in IDWR to enhance capability to analyze water use and evapotranspiration to support water conservation planning and decision making. Enhance this application to improve access and features to support use by public agencies, land owners, and private companies. This application will support long-term goals for management of a valuable resource and its effective use in support of the state's economy.
	**Water Rights Adjudication**	Build on past use of GIS to support analysis for the resolution of legal cases to resolve water rights claims and disputes. GIS technology supports the evaluation of property ownership and analysis with water sources and water use to quickly compile information needed for equitable adjudication. This application would provide an intuitive interface for an application available to the legal community, land owners, and government officials involved in water rights cases.
	**State Lands Management (IPRS)**	Deploy GIS application, now in development, to support access to information and decision making regarding state land transactions (land sale and acquisition), insurance management, and lease management.
	**Statewide Map Viewer**	An intuitive and interactive map-based search and query tool that is accessible via the Web. This could be built on existing services (IDWR's Map Server and INSIDE Idaho) to provide basic map information and simple query and geographic analysis tools useful by the public, business, and government personnel. The application could be integrated with commercially supported Web-based mapping services (e.g., Google Earth, Microsoft Virtual Earth)
	**Executive Map-based Dashboard with "Geostatistics"**	This application would be aimed at management personnel in government agencies and, potentially, private companies as well. It would provide an easy-to-use menu-based interface to present important statistics (economic data, contact info, program performance, and demographic data) from a geographic perspective. The application would support map views and supporting text reports and graphs

Table B1: Candidate High-Priority GIS Applications for Early Development (con't)

Application		Description and Impact
	**State Road Inventory**	GIS support for the state's annual inventory or public roads to provide information in support of asset management, and capital project planning—including decision making in support of allocation of funds for road projects. The application would include effective tools for entering road information and for displaying custom maps.
	**Wind Energy Potential Analysis**	Build on work completed by IDWR in a project with other organizations (INL, America Wind Energy Association) to provide a Web-based tool for accessing information on wind energy potential and existing wind energy sites and development projects. The application would provide a query capability for site location (for new development) and to find information about existing wide energy sources.
	**School Bus Allocation and Planning**	Use the spatial analysis and data integration capabilities of GIS to geographically examine school locations, student populations, and road networks to support the planning of bus routes—to optimize time and trip mileage while addressing efficiency and student safety. This would have a potential impact on the cost of fuel, vehicles, labor, and maintenance. The application could be used at the local level or on a statewide scale.
	**Vehicle Trip Mile Analysis**	Use of standard geographic analysis tools with statewide road network data to evaluate trip miles and costs to support planning for public program administration—with the goal of reducing vehicle miles (for cost savings and lowering carbon emissions). The application could be applied to evaluation of commuting/carpooling planning, flexible work hours and telecommuting, and analysis of field services with significant vehicle use.
	**"After 3" Youth Program Locator**	Expansion of a GIS application used in the City of Boise to provide a geographic locator tool to query and access information on youth programs. The application supports families and youth, schools, public agencies that provide youth services and private business that support youth services. The application for Boise could be used as a model for deployment in communities throughout the state.
	**Emergency Services Radio Communications Planning**	Expand use of GIS capabilities to evaluate geographic variables for the planning and deployment of radio communication networks (placement of antennas and repeaters) for public safety and emergency services. The application would provide access to topographic and other map data and use accepted radio propagation models to test scenarios for placement and to compare costs.
	**Economic Development Site Selector**	Enhance current Gem State Prospector web-based application with additional GIS functionality for query and viewing of geographic information.

APPENDIX C:
DETAILED EXPLANATION OF
SDI IMPLEMENTATION INITIATIVES

APPENDIX C: DETAILED EXPLANATION OF SDI IMPLEMENTATION INITIATIVES

Implementation initiatives are presented in this section. These implementation initiatives identify areas of work organized under each of the high-level goals. These implementation initiatives together form a comprehensive work program which establishes a framework for specific work activities to accomplish the SDI goals. Table C1 describes the implementation initiatives and indicates how they support one or more of the SDI goals. A priority score is also assigned to each initiative to provide a basis for detailed planning and execution of work elements. The priority is a relative indication of the initiative's importance to goal accomplishment and the urgency for carrying out the necessary work. Priority scores are:

- **Very High (VH)**—Fundamental for the accomplishment of the designated strategic goal with most other goals dependent upon it. It is critical that major progress be made on this initiative by the end of Year 1 (2009).
- **High (H)**—Very important for accomplishing the overall mission with multiple goals dependent upon major progress. Work should begin as soon as possible with planned completion or major progress by the end of Year 3 (2011) or sooner if possible.
- **Moderate (MOD)**—Significantly impacts achievement of the overall mission and other selected goals. Work should begin by the middle of Year 2 or before with planned completion or major progress by the end of Year 4 (2013) or sooner if possible.
- **Low (L)**—Important for overall success of SDI development, but there is flexibility in work scheduling given resource and time limitations. These initiatives should be scheduled and work initiated as resources permit with a projected completion by the end of Year 5 (2014).

Implementation initiatives are organized by the following categories:

- Organizational and management structure and practices (O)
- Data development or management (D)
- System configuration, software, or application development and operation (S)
- Education, outreach, and internal/external communications (E)
- Funding, budgeting, cost-benefit evaluation, and financial management (F)
- Legal or policy development and management (L)

Table C1: Explanation of Implementation Initiatives

ID Numbers	Implementation Initiative (Organized by Type*)	Priority	Explanation and Outcomes	Relationship to Goals								
				Goal 1: Justification/Financing	Goal 2: Coordination/Mgt.	Goal 3: Framework data	Goal 4: Leverage technologies	Goal 5: Regional program	Goal 6: SDI awareness/support	Goal 7: Non-Framework	Goal 8: Non-traditional GIS	Goal 9: Monitoring trends
Organizational and Management Structure and Practices												
O1	Improve and define role and composition of IGC	**VH**	Formally establish the recommended Idaho Geospatial Council and its Executive Committee. Define membership and roles and improve operation of IGC to leverage membership and take actions on recommendations. This improvement is part of an overall modification of the current organizational structure. It includes formal documentation of the structure, the creation of bylaws and operating procedures, and the assignment of roles		**X**							
O2	Set up templates, practices, and procedures for overall plan monitoring and reporting	**VH**	Establish procedures and practices and create reporting format templates for overall monitoring of progress on Strategic goals and implementation initiatives in the SDI *Strategic Plan* and *Business Plan*. Put in place ongoing monitoring and reporting.		**X**							
O3	Set up templates, practices, and procedures for detailed work plan preparation and management	**VH**	Establish guidelines and templates for preparation of detailed work plans—for work on implementation initiatives. Document acceptable project management practices for team development and ongoing project administration, monitoring, communications, and reporting.		**X**							
O4	Refine and finalize formal procedures and policy for data standard development and approval	**VH**	Examine current approved policies and guidelines for standards and policy development and approval, make appropriate revisions, and have these revisions approved by the ITRMC. Communicate these guidelines and policies to all parties who make use of them and oversee their use.		**X**	**X**						
O5	Establish and formalize state agency stakeholder coordination group	**VH**	As part of the recommended organizational structure for the SDI, set-up the State agency coordination group whose purpose is to is to address SDI and GIS technology issues of direct interest and importance to state agencies and to facilitate communication, coordination, sharing of resources, development and adoption of standards, joint project work, in support of SDI goals and overall efficiency of GIS operations and resource usage.									
O6	Support formal legislative recognition of State CIO Office	**H**	Support revision in the organizational mandate for the state Office of the CIO and its move (along with the Idaho Geospatial Office) to a new administrative location (e.g., Governor's Office). Support formal recognition of the CIO's role and authority for oversight and guidance on IT and GIS for state agencies. [Also included as L2]		**X**							
O7	Establish more formal geographic data sharing cooperative	**H**	Formalize policies and get statewide support for sharing of geographic data (Framework and non-Framework) in a manner that promotes statewide sharing and use by participants. Adopt policies like those in other states (North Carolina, Ohio, Oregon) and concepts espoused in the NAS-National Research Council publication, *Licensing Geographic Data and Services* (National Academy Press, 2004) for a "data commons" [Also included as D10]		**X**	**X**						

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Organizational and Management Structure and Practices (con't)												
O8	Explore and define options for providing GIS services to low-resourced jurisdictions	**H**	Examine the options for providing outsourced GIS services that may allow contracted GIS services or support from a government agency that could provide an avenue for GIS implementation by low-resourced jurisdictions--a less expensive approach for GIS development.	**X**	**X**			**X**				
O9	Establish Regional Resource Centers	**H**	Establish several locations around the state (3 to 6) that will serve as "regional resource sites" for user organizations in geographic proximity. These centers act as points of coalescence for GIS user organizations in different areas of the state and help to connect local activities with the statewide SDI program. They will be supported by existing institutions or groups (e.g., universities, existing regional GIS user groups) that have GIS resources sufficient to provide some support to users. These regional centers would be managed in coordination with the Idaho Geospatial Office (IGO). Depending on regional needs, they could provide a number of services and support functions, such as: a) answering technical questions for users, b) providing some general "consulting" support and advisory services for organizations in the process of GIS development, c) training sessions, d) site for meetings and special SDI events, and e) aggregate and serve regional Framework data. [Also included as E5]		**X**			**X**				
O10	Create "template" organizational structure and policies to support enterprise GIS development	**MOD**	Government agencies at state and local level could use "organizational models" and guidance to support their development of enterprise GIS programs that serve multiple departments and user groups and encourage collaboration and sharing of resources; create "library" of best practices for GIS management and operations.		**X**							
O11	Reduce redundancy and duplication of similar data sets in government agencies	**MOD**	Encourage user organizations to evaluate and identify redundancies in data maintenance and work to eliminate the redundancies. By providing effective data standards and template data models and organizational models that can enable organizations to reduce or eliminate duplicate and overlapping data and operations. [Also included as D9]	**X**	**X**	**X**						
F1	Business case and materials for promoting GIS	**VH**	Develop materials that more effectively sell GIS technology and the statewide SDI effort--based on applications, support for user business needs, and benefits; build effective business case; get effective user testimonials and leverage successes of existing users; make use of "GIS Day" events; create better educational materials; focus on senior management and senior official support.	**X**								
F2	Review and re-introduce legislation for County Recorder fee	**VH**	Revise and get support for introduction of legislation for fee on recorded documents and creation of special fund to support local GIS database development.	**X**								

Table C1: Explanation of Implementation Initiatives

ID Numbers	Implementation Initiative (Organized by Type*)	Priority	Explanation and Outcomes	Relationship to Goals								
				Goal 1: Justification/Financing	Goal 2: Coordination/Mgmt	Goal 3: Framework data	Goal 4: Leverage technologies	Goal 5: Regional program	Goal 6: SDI awareness/support	Goal 7: Non-Framework	Goal 8: Non-traditional GIS	Goal 9: Monitoring trends
Organizational and Management Structure and Practices (con't)												
F3	Seek State "base funding allocation" to support key SDI development	**VH**	Make state general fund requests to support high-priority SDI development work and create a base level of funding to spur overall development work; cite experiences of neighboring states (MT, UT, AZ, OR).	**X**								
F4	Identify and focus development on several key business areas and "killer applications"	**VH**	To garner support and realize benefits of GIS technology, pursue focus on key high-priority areas like: public safety and homeland security, b) efficiency gains, c) economic development, d) infrastructure management/maintenance, e) energy efficiency	**X**			**X**					
F5	Explore, make recommendations for, and secure nontraditional funding sources	**H**	Identify and take action on pursuing funding sources for GIS outside of traditional general fund budget allocations.	**X**								
F6	Improve coordination of E911 funding mechanism	**MOD**	Support consistent statewide policies and approach for E911 fund collection and use of funding for GIS development that supports public safety needs; make better business case for use of E911 funds for SDI.	**X**	**X**							
F7	Examine and confirm state purchase contracts and enterprise license agreements with specific GIS vendors	**MOD**	Identify key software vendors and explore possible changes to state purchase contracts or the use of an enterprise license approach to facilitate and potentially reduce the cost of software license purchase and maintenance	**X**	**X**							
Legal or Policy Development and Management												
L1	Clarify and potentially amend state public records laws	**VH**	Provide clear guidance and, if necessary, make amendments to law, to ensure consistency in adherence and policies in GIS data distribution and fee setting		**X**							
L2	Support formal legislative recognition of State CIO Office	**H**	See initiative O6		**X**							
L3	Seek state legislation as basis for stronger statewide SDI governance	**H**	Pursue state legislation, perhaps along with appropriate executive orders, to establish SDI program governance structure, funding, and policies.		**X**							

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ID Numbers	Implementation Initiative (Organized by Type*)	Priority	Explanation and Outcomes	Relationship to Goals								
				Goal 1: Justification/Financing	Goal 2: Coordination/Mgmt	Goal 3: Framework data	Goal 4: Leverage technologies	Goal 5: Regional program	Goal 6: SDI awareness/support	Goal 7: Beyond Framework	Goal 8: Non-traditional GIS	Goal 9: Monitoring trends
Legal or Policy Development and Management (con't)												
L4	Develop, enhance, and approve formal policies, procedures, and formal practices:		The sub-initiatives are described below for formal policies, practices, practices, internal agreements, etc., that will be reviewed by the IGC and submitted to the ITRMC or other authorities for approval.		**X**							
L4a	Policy for SDI standards consensus and approval	**H**	Prepare and get consensus on policy for presenting, reviewing, and recommending data standards (by the IGC) and getting formal approval by the ITRMC		**X**	**X**						
L4b	Policy for statewide geographic data sharing (data cooperative)	**H**	Prepare and get consensus on policy that defines parameters and terms governing geographic data ownership and sharing of data to participants in Idaho's SDI. Policy will move toward more open model for data sharing taking into account issues of proprietary data, value-added use, and privacy concerns		**X**	**X**						
L4c	Policy on SDI plan and project management and reporting	**H**	Prepare and get consensus on policy for use of formal project planning, management and reporting practices and tools for all work activities that are undertaken as part of the SDI development (and recognized by the IGC).		**X**							
L4d	Agreements and formal procedures defining responsibilities and practices for Framework data stewardship	**H**	Written procedures, interagency agreements or charters, and defined practices that serve to assign responsibilities and requirements for ongoing update and maintenance of Framework themes		**X**							
L5	Develop template database specifications and procurement templates	**MOD**	Prepare template specifications for Framework collection and development. These specifications would reference applicable data standards and include technical specifications for data conversion and capture, format of deliverables, quality criteria, and work performance criteria. These template standards would be a model for use by any stakeholder organization for a data conversion project or procurement of private data development services.			**X**						
L6	Records Retention	**L**	Examine legal and regulatory requirements for public records retention as it impacts geographic databases and products (maps) for state agencies and local governments. Prepare recommendations and support development of policies for sound records management and retention to ensure compliance with applicable laws and rules.		**X**	**X**						
Geographic Data Development or Management												
D1	Revise/reach consensus on Framework	**VH**	Evaluate current Framework themes and candidates for inclusion. Reach consensus on additional Framework themes, possibly including: public safety, hazards, bioscience, utilities, and climate (as recommended by the IGO). Create a database and tool to track status and stewardship responsibility.			**X**						

Table C1: Explanation of Implementation Initiatives

ID Numbers	Implementation Initiative (Organized by Type*)	Priority	Explanation and Outcomes	Relationship to Goals								
				Goal 1: Justification/Financing	Goal 2: Coordination/Mgmt	Goal 3: Framework data	Goal 4: Leverage technologies	Goal 5: Regional program	Goal 6: SDI awareness/support	Goal 7: Beyond Framework	Goal 8: Non-traditional GIS	Goal 9: Monitoring trends
Geographic Data Development or Management (con't)												
D2	Process results from IACA parcel needs survey and develop conclusions	**VH**	Complete the current GIS survey to Idaho Association of County Assessors (IACA). Process and compile results. Draw conclusions from the survey data and use this as a basis to initiate active work on cadastral data standards and development specifications.			**X**						
D3	Examine and resolve boundary problems with Census enumeration areas	**VH**	Examine miscorrespondence in positional accuracy of Census Bureau enumeration areas which are based on local geographic features (street centerlines, jurisdictional boundaries, physical features) and the correspondence with digital map boundaries maintained by local governments. Make necessary adjustments to make it easier to use Census demographic data (interim projections and 2010 Census data) and integrate this with existing GIS data.			**X**						
D4	Complete development of Framework data	**H**	Include on-line service for GCDB enhancement and survey monument data access; Establish more active role for state coordination and support for County parcel; use NAIP funding mechanism for enhanced statewide orthoimage development: Classification schemes, standards, ID codes, data content standards			**X**						
D5	Formalize long-term program and sustained support for Orthoimagery enhancement	**H**	Continue to administer the current NAIP partnership program and encourage additional support and funding contributions for 2009 acquisition. Seek future funding through legislative appropriations and create sustained support and a long-term program for regular reflights, updates, and expanded funding participation.	**X**		**X**						
D6	Designate responsibilities and develop procedures for Framework data stewardship	**H**	Designate responsibilities for maintenance of each Framework data theme and define workflows for ongoing data maintenance. Build and deploy effective applications for data update, quality control/quality assurance, posting of data for wide access.		**X**	**X**						
D7	Improve approach and tools for notification of database updates and for easy search and discovery of the current authoritative source	**H**	As part of a general effort for more effective capture and access to metadata, put in place a procedure (run by designated data stewards) to provide notification of database updates and clear identification of the authoritative sources for Framework data. Develop a "trademark" to distinguish Framework data from other spatial data.			**X**						
D8	Encourage and coordinate capture and management of data to support public safety response	**H**	Provide support in the area of standards development, specifications, and project coordination for developing accurate databases on critical facilities and emergency service boundaries to support state, federal, and local law enforcement and fire protection agencies.			**X**						
D9	Reduce redundancy and duplication of similar data sets in government agencies	**H**	See initiative O11	**X**	**X**	**X**						

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Geographic Data Development or Management (con't)												
D10	Establish more formal geographic data sharing cooperative	**H**	See initiative O7		**X**	**X**	**X**	**X**				
D11	Update Idaho metadata profile and develop more effective metadata management tools	**H**	Make needed updates to Idaho's existing metadata profile to address statewide user community. Ensure that software tools (e.g., ArcGIS metadata management features) support the Idaho profile. Design and deploy improved software tools for easy capture of metadata and for flexible queries and access to metadata.			**X**						
D12	Establish Web-based service for input of and access to information on qualified survey control and monumentation	**H**	Evaluate current Web-base services of the NGS and design and implement a Web-based service for entry of new, enhanced survey control information compiled by qualified surveyors. Use this service as a clearinghouse for access to accurate survey control points and use updated data to improve the accuracy of GIS data layers.			**X**	**X**					
D13	Define long-term approach for resolution of problems with governmental boundary placement	**H**	Examine extent of boundary problems (inaccurate or ill-defined placement of County and state boundaries) and prepare standards and guidelines that supports incremental boundary improvements			**X**						
D14	Create index of Web-based geographic data sources and services	**H**	Compile an index with descriptive information and links to Web sites maintained by public sector (federal, state, local) and other organizations that provide access to geographic data and services. [Also included as S9]		**X**	**X**						
D15	Develop template database specifications and procurement templates	**MOD**	See L5			**X**						
D16	Promote use of the single state coordinate system and deploy tools for effective software use	**MOD**	The state's single state map coordinate system (IDTM) provides great benefits to statewide GIS applications and mapping operations since it provides an accurate statewide map view without projection zone boundaries. Its use needs to be promoted, and it needs to be made easily accessible in GIS software and data exchange processes. Work includes increasing awareness and acceptance, support for its use through inclusion in new state statute, of the single zone projection (IDTM) and communication of this for use by all parties. Build technical tools for access to IDTM by all GIS software in use			**X**	**X**					

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				Goal 1: Justification/Financing	Goal 2: Coordination/Mgmt	Goal 3: Framework data	Goal 4: Leverage technologies	Goal 5: Regional program	Goal 6: SDI awareness/support	Goal 7: Beyond Framework	Goal 8: Non-traditional GIS	Goal 9: Monitoring trends
Geographic Data Development or Management (con't)												
D17	Establish program and provide ongoing guidance for non-Framework database development	**MOD**	Provide support to stakeholder organizations in the development of non-Framework data. This may include input on the development of standards, compilation of specifications, facilitation for joint database development projects, and encouraging use of standard specifications.							**X**		
D18	Explore and design approach for archiving and management of historic data	**L**	Examine needs for the storage and management of historical GIS data and design appropriate data model and GIS software tools for archiving of historic data and flexible access to it in a GIS environment.				**X**				**X**	
System Configuration, Software, or Application Development and Operation												
S1	Improve INSIDE Idaho support and services and enhance connections and access to distributed Web-based services	**VH**	Provide sustained funding source for INSIDE Idaho, and improve Web interface and range of services for users; examine integration with and access to external Web data sources and services including Google Earth, Virtual Earth, Geospatial One Stop, NSGIC Ramona; ensure effective imagery service with ability to combine NAIP imagery with local sources.				**X**					
S2	Complete data standards for Framework themes	**VH**	Continue and accelerate activities for developing and approving data standards and specifications for Framework data--to stimulate development of statewide data; communicate standards and provide guidance on their use.			**X**						
S3	Identify, design, and develop at least one enterprise GIS application	**VH**	For the purpose of generating support for SDI development and targeting high-priority business areas, identify and initiate development work on at least one application (public safety, economic development, etc.). Develop and deploy for the target user communities. (See F4 for high-priority business areas.)	**X**			**X**					
S4	Encourage and support improved statewide wide area network communications	**VH**	Encourage and support efforts to unify and enhance high-speed digital network access across the state.		**X**		**X**	**X**				
S5	Move toward statewide 'virtual portal" for Web-based access to spatial data and services	**H**	Design and build an enhanced Web-based tool for geographic data and services that acts as a "virtual portal"--a Web application that can combine centrally-stored data, direct access to and integration of data on other Web sites, and a range of GIS services. This should include a tight connection and functional relationship with geospatial data sources in the state and Web-based services that support the NSDI (e.g., the National Map, NSGIC Ramona, Geospatial One Stop)				**X**					

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System Configuration, Software, or Application Development and Operation (con't)												
S6	Complete development and deploy integrated property records system (IPRS)	**H**	Gather ownership records for state-owned and –leased land and structures in enterprise database for query and reporting and development application for data query, access and reporting.			**X**	**X**					
S7	Examine current GIS software licenses and costs and evaluate options for changes	**H**	Coordinate with Work under F7 to make changes to licensing approaches with goal to lower costs and to manage licenses more efficiency.		**X**		**X**					
S8	Work with IT Staff to examine server HW in state government and move toward server consolidation to reduce cost and system administration requirements	**H**	There is considerable GIS use by state agencies and a large number of computer servers are used at central offices and district locations around the state to support GIS data and applications. There is no current, complete inventory of the number of servers, their functions, costs for maintenance, etc. There is likely to be a cost savings for hardware and possibly for software licenses as well as a reduction in system administration by some reduction in the number of servers and consolidation in a manner that will not reduce service to users or requirements for maintaining GIS data resources.		**X**		**X**					
S9	Create index of Web-based geographic data sources and services	**H**	See Initiative D14.				**X**					
S10	Integrate GIS with "non-GIS" systems and databases	**MOD**	Identify business areas, not traditional for GIS, which can benefit from geographic data and GIS capability (transportation, public health, financial analysis, transportation); define technical and organizational approaches for integration and "embedded GIS"; examine integration and access to external Web data sources and services including Google Earth, Virtual Earth.				**X**				**X**	
S11	Explore new application technologies and recommend adoption as appropriate	**MOD**	Explore the potential use and value of "new" GIS industry products and services such as Micrometry, GeoPDF, integration and mash-up with Web-based GIS portals from government agencies and private companies (Google Earth, MS Virtual Earth). Capture information on these products and services and prepare guidelines for their use								**X**	**X**
S12	Monitor and exchange information on industry trends and developments	**MOD**	Through ongoing professional reading, review of Web-based news and information, participation in industry events, conference attendance, etc., gather information about industry trends and products. Conduct basic evaluation and make notes about ideas for possible future use or adoption. Post this information for access by any member of the geospatial community.									**X**
S13	Continue to monitor and identify opportunities for new applications of GIS technology	**MOD**	Continually monitor new programs, special projects, and other opportunities where geographic data and GIS services could be applied. Conduct necessary research and hold discussion with program or project managers to explore use of GIS, leading to agreements for use of GIS.								**X**	**X**

Table C1: Explanation of Implementation Initiatives

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				Goal 1: Justification/Financing	Goal 2: Coordination/Mgmt	Goal 3: Framework data	Goal 4: Leverage technologies	Goal 5: Regional program	Goal 6: SDI awareness/support	Goal 7: Beyond Framework	Goal 8: Non-traditional GIS	Goal 9: Monitoring trends
System Configuration, Software, or Application Development and Operation (con't)												
S14	Design and move toward server-centric model for GIS	**L**	Explore opportunities and software supporting a move to a more server-centric computing model for GIS configurations. This includes evaluation of ESRI ArcGIS Server software and other server software that supports centralization of data and services at the server.									**X**
S15	Develop guidelines for system administration and security for GIS configurations	**L**	Prepare template guidelines and best practices for sound technical administration of GIS hardware and network configuration (hardware and network specifications, security, system monitoring, data back-up and recovery) that can be used as a starting point for any organization in GIS development and operation.		**X**							
Education, Outreach, and Communications												
E1	Prepare SDI "Communications and Promotion Plan", execute and monitor actions	**VH**	This is a detailed plan that defines an approach and specific actions for long-term promotion and communications about the SDI effort. Its objective is to identify specific actions and assign roles to increase awareness and support for the SDI and to sustain communications among all stakeholder groups. This Plan describes and provides a foundation for coordination of specific communications, marketing, outreach, and senior official support building activities that are covered in multiple implementation initiatives. Section 5.3 of the Business Plan has more information about the content and format of the plan.		**X**				**X**			
E2	Engage and recruit participants for the newly formed Idaho Geospatial Council	**VH**	Carry out promotion to increase awareness of the SDI and actively solicit participation and membership, on the Geospatial Council, with the goal of filling all seats from multiple stakeholder groups.		**X**				**X**			
E3	Actively pursue outreach with professional and industry associations	**H**	Build better communication with professional and industry associations and use their forums to educate about GIS and promote and gain support for the SDI effort. Groups might include: existing regional GIS user groups, ID Association of Counties, Sheriffs Association, Rural Water Operators Association, APSCO, ID Cities Association, ID Association of Assessors, URISA NR Chapter		**X**				**X**			
E4	Create and maintain a GIS-enabled directory of GIS contacts and personnel around the state.	**H**	Compile a directory of people--principally users and technical staff with GIS expertise who may serve as a resource for information and technical support to other GIS programs. Provide contact information to facilitate networking and build an application to GIS-enable the directory to easily identify the location of the contact person.		**X**			**X**	**X**			
E5	Establish Regional Centers as part of SDI organizational Structure	**H**	See initiative O9		**X**			**X**				

Table C1: Explanation of Implementation Initiatives

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Education, Outreach, and Communications (con't)												
E6	Prepare GIS education/training plan and put in it in place	**H**	Prepare a formal, comprehensive education and training plan that guides GIS related education and training activities for all stakeholders. The plan will describe education and training goals and types, sources, and consumers of education and training materials and activities. This Plan will culminate in assignment of roles and clear objectives and the initiation of work to put in place plan objectives.						**X**			
E7	Provide better access to educational materials and professional networking	**MOD**	Improve educational materials about GIS (improvement or increased subscriptions to Geotech Listserv); improve mechanisms and directory information for professional contacts and networking (maybe geocoded database of people).						**X**			
E8	Compile and maintain a directory of GIS training sources and opportunities	**MOD**	This would be an on-line directory, regularly updated, that gives users and technical staff in Idaho information about upcoming events and sources for training, education, and professional development. It would include training courses and seminars sponsored by government agencies, universities, vendors, professional associations, and private trainers; conferences; training materials; and on-line courses.		**X**				**X**			
E9	Explore and deploy emerging collaboration and professional networking tools	**MOD**	There is a wealth of existing and emerging automated tools that support more effective communication and collaboration for people and group that enable joint work on projects and information transfer in a geographically distributed environment. Such tools include electronic conferencing (including video-based), project management tools that support team collaboration, document/content management tools to facilitate access to information and revision tracking, workflow automation, and Web-based tools (Wikis, blogs, social networking, etc.). These have potential value for SDI collaboration and they should be explored, tested, and deployed where they can improve development and operations work.		**X**		**X**		**X**			

(1) Type: Organizational and management structure and practices (O); Data development or management (D); System configuration, software, or application development and operation (S); Education, outreach, and internal/external communications (E); Funding, budgeting, cost-benefit evaluation, and financial management (F); Legal or policy development and management

APPENDIX D:
DETAILS OF SDI COST PROJECTIONS

APPENDIX D: DETAILS OF SDI COST PROJECTIONS

This Appendix provides detailed information for the SDI cost projection summary information provided in Section 4. Two tables are included which provide describes and assumptions on the cost projections and provide cost figures for each year of the five-year SDI plan period. Table D1 is a summary table which presents cost projections for all of the SDI cost categories summarized in Table 9 (Section 4.4). Table D2 and D3 provide information about Framework data development and related database activities with projections of costs over the five-year period of the plan.

It should be noted that out of the total projected SDI development cost of about $26.3 million, a significant part of these projected costs (approximately 40%) are already committed or budgeted by government agencies. The majority of the committed or budgeted funds are for Framework data development as part of approved projects and funding sources managed by federal and state agencies. As already mentioned, the standards and improved coordination put in place through the SDI will ensure that all currently budgeted and new expenditures are used to their maximum benefit.

Table D1: Five-Year Projections for all SDI Development Cost Categories

		Budget Projections						
SDI Cost Category	**Explanation**	**2009**	**2010**	**2011**	**2012**	**2013**	**5-year total**	**Existing or Anticipated Funding Source**
Augmented staff and operational budget for IGO	Cost for additional staff and office operational costs for SDI leadership, management, and technical coordination	$78,000	$81,900	$85,995	$90,295	$94,810	**$431,000**	Proposed budget increases submitted for FY10
IGC Operational Support	Administrative, meeting, and travel costs to support the work of the newly formed Idaho Geospatial Council and its Executive Committee	$6,000	$11,000	$11,000	$12,000	$12,000	**$52,000**	
Outreach, Communications, Promotion	Support for SDI communications, preparation of promotional materials, meetings, events, and other work to support participation by and coordination of SDI stakeholders	$9,500	$8,000	$8,500	$9,000	$9,500	**$44,500**	
Framework Database Development and Stewardship	Statewide development of Framework data themes including contractor costs and in-house staff resources.	$3,183,000	$5,274,000	$5,441,000	$5,440,000	$4,326,000	**$23,664,000**	See Tables D2 and D3. Funding for portions of development already included in State and federal agency budgets
Regional Center Development and Support	Costs to support planning, organization of an ongoing operation of Regional GIS resource centers.	$40,000	$80,000	$110,000	$140,000	$140,000	**$510,000**	Funding would be shared between hosting organizations and state government allocations
Computer Hardware, Software, Network Infrastructure	Acquisition and upgrade of computer hardware, GIS software, and network infrastructure that specifically addresses SDI development (for IGO and special SDI projects)	$10,000	$10,000	$10,000	$10,000	$10,000	**$50,000**	
Training/Education	Costs for planning and coordinating GIS education and training and support for ongoing work in developing training programs and providing services to the SDI community.	$45,000	$80,000	$80,000	$90,000	$90,000	**$385,000**	Augment existing State University funding through state government allocations and potentially new grant sources

Table D1: Five-Year Projections for all SDI Development Cost Categories

SDI Cost Category	Explanation	Budget Projections						Existing or Anticipated Funding Source
		2009	2010	2011	2012	2013	5-year total	
GIS Application Development and Deployment	Costs for the development of custom GIS applications or GIS integration to support SDI operations and stakeholders.	$400,000	$200,000	$100,000	$100,000	$100,000	**$900,000**	Requires new funding allocation from multiple sources--agencies and organizations that will benefit from the applications.
INSIDE Idaho Enhancement/Virtual Portal Development and Operation	Costs for enhancement of current INSIDE Idaho services and for development of virtual portal Web service.	$100,000	$200,000	$200,000	$100,000	$75,000	**$675,000**	Additional State government allocation and potential outside sources to augment existing budget from University of Idaho
	TOTAL	**$3,871,500**	**$5,944,900**	**$6,046,495**	**$5,991,295**	**$4,857,310**	**$26,711,500**	

Table D2: Description of Framework Data development and Information on Cost Projections

Note: This Table describes the Framework Themes and related data development activities and provides information on which the cost projections (in Table D3) are based.

Framework Theme	Description of Theme	Basis for Cost Projection
Cadastral Reference/ GCDB	Establishing more accurate horizontal and vertical coordinates for GCDB monumented survey corners	Estimates based on input from Bureau of Reclamation and Bureau of Land Management and reflect ongoing commitment of resources for database enhancement and development.
Elevation (general statewide)	Statewide digital elevation model at least equivalent to 10-meter DTED	No additional database development for this theme is projected.
Elevation (detailed)	Includes elevation models generated from LIDAR or traditional photogrammetry for local project use	Estimate for known or anticipated projects sponsored by local, state, or federal agencies (flood plain mapping, etc.). No projection for statewide coverage is included--only general estimates for selected small projects.
Geodetic Control	Densification of monumented control points with accurate horiz and vertical coordinates	Scheduled height modification work by ITD and process for incorporating surveyed points. Takes into account CORS work already completed.
Governmental Boundaries (general gov boundaries)	State, County, City boundaries	Assumes work to improve current boundary data maintained by the State Tax Commission to parcel-level accuracy.
Governmental Boundaries (Taxing Districts)	Taxing districts and voting districts aligned with parcels and jurisdictional boundaries	Enhance and update existing data maintained by State Tax Commission for proper alignment with parcel and jurisdictional boundaries.

Table D2: Description of Framework Data development and Information on Cost Projections (con't)

Framework Theme	Description of Theme	Basis for Cost Projection
Governmental Boundaries (Election districts)	Election districts (for state, federal offices) and voting precinct boundaries	Costs for improvement of existing data developed and maintained by Legislative Services Office project. Includes improvement of accuracy (proper alignment with political boundaries).
Governmental Boundaries (agency and programmatic boundaries)	Boundaries of formally defined federal and state government agency districts, regions, or service areas.	Use and enhance existing digital boundary data but add to it to get a comprehensive set of boundaries with good accuracy and correspondence with political boundaries, natural features, etc.
Hydrography (surface water and watersheds)	NHD hydrological basins and surface water network	Funds to cover IDWR personnel and direct costs for refinements to current NHD data
Land Cover	General Level 1 or Level 2 land cover mapping from national land cover dataset (NLCD) and other sources	No additional database development for this theme is projected.
Land Use	Local, parcel level mapping of existing land use.	Some funding to support development of standards (e.g. common classification scheme) and pilot work useful for local projects. Does NOT include costs for statewide database development.
Orthoimagery	1-meter statewide color	Coverage in 2009 from NAIP and reflight in 2012. Include just anticipated costs for the state, not the federal contribution
Parcels (taxable parcels)	Real property, taxable parcels (private ownership) recognized by County Assessor	Based on estimated total of ~915,000 parcels in the state with different level of work required for full GIS automation. Assumes about 650,000 parcels exist in good GIS format and rest of parcels in various digital or hard copy map format. Includes costs for contracted or in-house personnel to capture parcel data and format into GIS database. Cost also includes development of state portal and ongoing parcel maintenance
Parcels (state owned)	Real property parcels owned by state government.	Costs based on ongoing IPRS work with assumption that about 75% is already complete. Cost figures do not include capture of ITD right-of-way boundaries.
Parcels (federal owned)	Real property parcels owned by any federal agency.	General estimate reflecting ongoing work by federal agencies with assumption that about 80% of federally owned parcels are in digital format.
Transportation (public road network with address ranges)	Statewide network of all public roads (fed, state, local) with basic attribution	Assume only small costs needed for update and formatting of Interstate and State highway data maintained by ITD. For local roads (county, municipal) use figure of $60 per mile reflecting photogrammetric or GPS vehicle capture via contract. Projection assumes that good GIS data exists for about 20,000 miles of an estimated 95,000 miles of local/county roads and streets.
Transportation (trails)	All recognized recreational trails for access by ATV, bike, or on foot. Includes trails over public and private lands	Examination of data gathered for trails planning application with Idaho Parks & Recreation Dept. Assumes that most trail data already captured for US Forest Service Lands and about 30% is complete for State and other recreational trails

Table D2: Description of Framework Data development and Information on Cost Projections (con't)

Framework Theme	Description of Theme	Basis for Cost Projection
Bioscience-Wetlands	Two existing data sources: a) US FWS National Wetlands Inventory (partial state coverage) and b) IDFG "priority wetlands" mapping	Use of new NAIP imagery for completing and updating IDFG wetlands (staff costs for 3 years)
Bioscience-Wildlife Habitat	General classification of habitat characteristics (not species-specific). Different sources including GAP and ReGAP programs (Landsat-based cover classification) and Ecological Systems from state Natural Heritage Program	Data already exists in GIS format. No additional costs projected.
Bioscience-Ecoregions	Includes two different Ecoregion classifications: a) EPA (Omerik) and b) USFS (Bailey)	Data already exists in GIS format. No additional costs projected.
Bioscience-Fish Distributions	Generalized, stream-based distributions of anadromous and native salmonid (trout) species.	Data already exists in GIS format. No additional costs projected.
Climate	Historical information on precipitation, snowpack, and temperature.	Use existing INSIDE Idaho data for historical precipitation-includes point and polygon data. Compilation and loading of data from other data sets.
Geoscience (Geology)	Geology as mapped and compiled by the Idaho Geological Survey. All new mapping is at 1:24,000 and tiled in 30 x 60 minute management chunks.	Estimate based on ID Geological Survey budget for completion of 1) Tools to manage data and data migration from digitizing format to Geodatabase; 2) migration of compiled 30 x 60 minute geology tiles into Geodatabase; and 3) ArcServer delivery (code, GUI, etc.).
Geoscience (Soils)	SSURGO county soils survey mapping under the National Cooperative Soil Survey umbrella agreement	Includes additional costs projected for the soils mapping by the Natural Resources Conservation Service (NRCS) with the assumption that 85% of private lands have been mapped.
Natural Hazards	Flooding, Earthquakes, Avalanches, Landslides (events/conditions and modeled risk)	
Public Safety (critical facilities and address points)	Location of facilities important for emergency response (stations, shelters, schools, medical facilities, etc.). Also includes address points for parcel centroids and other key features. Work needed to blend existing sources and to capture new data.	HSIP Freedom; IPRS state facilities: GNIS. Costs take into account existing data from a variety of sources including Federal DHS HSIP data, state IPRS (state facilities), the national GNIS, other state agency data, and local sources. Costs reflect in-house or contracted services for additional data capture and formatting.
Public Safety (zones)	Emergency service zone boundaries (unique combinations of fire, policy & ambulance districts); PSAP services areas	Assumes existing data in some cases from local emergency services organizations and costs for additional database development and enhancement.

Table D2: Description of Framework Data development and Information on Cost Projections (con't)

Framework Theme	Description of Theme	Basis for Cost Projection
Utilities (broadband infrastructure)	Network that will support high-speed digital communications throughout the state.	Estimate based on $ per line mileage with understanding of source
Utilities (gas, petroleum transmission lines)	Path of large pipelines for the transportation (not distribution to service points) of natural gas, gasoline, and petroleum	Estimate based on $ per line mileage with understanding of source. Take existing data and build into data set.
Utilities (power transmission lines)	Path of lines and locations of towers for electric power transmission network	General estimate with an assumption that some data exists from power companies with need for additional funds for map compilation from orthoimagery and other sources.
Metadata Enhancement	Develop enhanced metadata entry and maintenance tools and templates and capture of additional metadata for Framework Themes	Enhancement of existing tools and software. Costs projections reflect estimated labor hours (in-house or contracted).
Single State Coordinate System	Integrate single state coordinate system and projection with all GIS software and promote its use.	
Development of Framework Standards and Template Specifications	Work resulting in accepted standards for all Framework Themes and template specifications to support database development work.	Work from existing standards and templates (in Idaho and outside) to create refined, accepted templates. Contracted services with staff time and intern time.

Table D3: Five-Year Cost Projections for SDI Framework Database Development

Note: These are general cost projections that reflect full costs for in-house staff or contracted services for database development (consistent with the assumptions stated in Table D2). These cost projections include funds and resources (staff) that have already been budgeted or are allocated for ongoing and future database development work by state and federal agencies.

	Cost Projections						
Framework Theme and Database Development Activities	**2009**	**2010**	**2011**	**2012**	**2013**	**5-year total**	**Currently Committed, Budgeted or Planned Funding Sources**
Cadastral Reference/ GCDB	$205,000	$531,000	$531,000	$531,000	$531,000	**$2,329,000**	Total amount reflects ongoing federal funding already budgeted or planned for the future.
Elevation (general statewide)	$0	$0	$0	$0	$0	**$0**	
Elevation (detailed)	$230,000	$200,000	$200,000	$200,000	$200,000	**$1,030,000**	General estimate reflecting funds already allocated or to be allocated by state and federal agencies.
Geodetic Control	$448,000	$448,000	750,000	1,019,000		**$2,665,000**	Height modernization is fully funded through ITD.
Governmental Boundaries (general gov boundaries)	$10,000	$10,000	$10,000	$10,000	$10,000	**$50,000**	Partial funding has been allocated in State Tax Commission.
Governmental Boundaries (Taxing Districts)	$65,000	$65,000	$65,000	$65,000	$65,000	**$325,000**	
Governmental Boundaries (Election districts)	$0	$0	$50,000	$0	$0	**$50,000**	Assumes funds already budgeted by Legislative Services Office and allocations from specific state agencies.
Governmental Boundaries (agency and programmatic boundaries)	$10,000	$20,000	$20,000	$10,000	$0	**$60,000**	
Hydrography (surface water and watersheds)	$40,000	$35,000	$35,000	$35,000	$0	**$145,000**	Funds budgeted by ID Water Resources and USGS.
Land Cover	$0	$0	$0	$0	$0	**$0**	
Land Use	$0	$5,000	$5,000	$0	$0	**$10,000**	
Orthoimagery	$20,000	$280,000		$35,000	$500,000	**$835,000**	Funding for 2009-2010 already committed
Parcels (taxable parcels)	$250,000	$595,000	$645,000	$685,000	$615,000	**$2,790,000**	No funds specifically committed although ongoing projects at local level are ongoing.
Parcels (state owned)	$20,000	$10,000	$10,000	$10,000	$10,000	**$60,000**	Funding already committed as part of IPRS project.
Parcels (federal owned)		$50,000	$150,000	$150,000	$100,000	**$450,000**	

Table D3: Five-Year Cost Projections for SDI Framework Database Development (con't)

Framework Theme and Database Development Activities	Cost Projections						Currently Committed, Budgeted or Planned Funding Sources
	2009	2010	2011	2012	2013	5-year total	
Transportation (public road network with address ranges)	$500,000	$1,500,000	$1,500,000	$1,300,000	$1,000,000	**$5,800,000**	State ITD has committed funds for State/Interstate highway data maintenance. Currently funded projects including: a) by LHTAC and b) the integrated roads project (INSIDE Idaho with USGS funding) will provide some funding as will E911 funds.
Transportation (trails)	$35,000	$5,000	$5,000	$5,000	$5,000	**$55,000**	
Bioscience-Wetlands	$0	$30,000	$30,000	$30,000	$0	**$90,000**	
Bioscience-Wildlife Habitat	$0	$0	$0	$0	$0	**$0**	
Bioscience-Ecoregions	$0	$0	$0	$0	$0	**$0**	
Bioscience-Fish Distributions	$0	$0	$0	$0	$0	**$0**	
Climate	$0	$20,000	$0	$10,000	$0	**$30,000**	
Geoscience (Geology)	$30,000	$10,000	$5,000	$5,000	$5,000	**$55,000**	All funds currently budgeted and committed by IGS.
Geoscience (Soils)	$1,100,000	$1,100,000	$1,100,000	$1,100,000	$1,100,000	**$5,500,000**	All funds budgeted and committed by the NRCS.
Natural Hazards	$75,000	$75,000	$75,000	$75,000	$75,000	**$375,000**	
Public Safety (critical facilities and address points)	$15,000	$105,000	$90,000	$30,000	$0	**$240,000**	Most of projected cost is funded through E911 funds.
Public Safety (zones)	$10,000	$25,000	$5,000	$0	$0	**$40,000**	
Utilities (broadband infrastructure)	$50,000	$10,000	$15,000	$15,000	$20,000	**$110,000**	Partial funding expected to be allocated by utility companies
Utilities (gas, petroleum transmission lines)	$5,000	$40,000	$50,000	$50,000	$40,000	**$185,000**	
Utilities (power transmission lines)	$5,000	$15,000	$20,000	$20,000	$20,000	**$80,000**	
Metadata Enhancement	$15,000	$35,000	$35,000	$30,000	$30,000	**$145,000**	
Single State Coordinate System	$5,000	$5,000	$0	$0	$0	**$10,000**	
Development of Framework Standards and Template Data Conversion Specifications	$40,000	$50,000	$40,000	$20,000		**$150,000**	
TOTAL	**$3,183,000**	**$5,274,000**	**$5,441,000**	**$5,440,000**	**$4,326,000**	**$23,664,000**	

APPENDIX E:
POTENTIAL SDI FUNDING SOURCES AND FINANCING STRATEGIES

APPENDIX E: POTENTIAL SDI FUNDING SOURCES AND FINANCING STRATEGIES

This Appendix provides an overview of nontraditional funding sources and financing strategies that are possible approaches to be examined for financial support to the SDI initiative. Many of these approaches have been successfully used for information technology and GIS programs in other states.

Allocation from Non-General Fund Budgets or Special Funds

Brief Description:	Designation of portions of non-General Fund budgets to support GIS development and/or operations.
Constraints:	Designated GIS expenditure must be aligned closely with the mandated purpose of the special fund. Requires budget submittal, justification, and approval. Subject to financial pressures, internal competition for fund use, and political factors that impact budget approvals. Non-general fund sources are not always applicable for ongoing operations costs (e.g., many capital budget items used specifically for GIS development purposes).
Frequency/ Importance:	Very frequently used by government agencies and public utilities.

Joint Funding/Project Partnerships with Outside Organizations

Brief Description:	Up-front, joint funding for common GIS development work (usually database development) by multiple agencies. Each agency contributes an amount based on agreed cost-allocation and shares in ownership of the product.
Constraints:	Considerable consensus-building and negotiation. Requires formal agreement among parties and designation of lead management agency. Requires administration of joint ownership and use.
Frequency/ Importance:	Used frequently for GIS database development (at least 20% of public agency programs) and for wide area network development.

Data Licensing or Subscriptions

Brief Description:	An organization which has ownership of a database (licenser) extends rights to user agencies (licensees) to use data under specified terms documented in a license agreement. License agreement has terms that define the data product and mode of delivery, limitations of use, and fees (optional).
Constraints:	Licenser agency must fund database development effort and establish data ownership. May be limitations in State Public Records or FOIA law that limits fees. Other legal constraints may govern terms included in license agreement.
Frequency/ Importance:	Frequent—by roughly 25% of public agency GIS programs which are owners of commonly used GIS data sets. Not all of these license agreements involve monetary fees. Some may involve in-kind contributions of data or services by licensee.

Special Transaction Fees

Brief Description:	May include a fee or allocation of part of a fee collected on a government transaction (e.g., permit application, filing fee). Recorder or Register of Deeds filing fees have been used successfully in a number of other states to fund GIS programs.
Constraints:	May require local ordinance or State legislation. Must be placed in special fund designated for use in development or operation directly tied to the specific program under which the transaction falls.
Frequency/ Importance:	Often used—by roughly 10% of public agency GIS programs. Amount of revenue varies widely among different jurisdictions and can be subject to economic variability (e.g., weather factors, economic downturns).

Grants

Brief Description:	Money provided to a public agency for a specific purpose based on meeting certain criteria documented in a grant application. Grants for GIS and information technology typically come from federal and state government agencies but may also come from private or not-for-profit sources.
Constraints:	Requires sometimes time-consuming research and grant application work and often a competitive selection process. Grant acceptance sometimes requires matching funds. Use of grant money has restrictions on use and well-defined tracking and accounting procedures must be used.
Frequency/ Importance:	Often used by government agencies—roughly 30% of GIS programs have used grant funding. In many cases the amount of grants are small.

Bonds

Brief Description:	Funding approach supplying up-front costs for development project through sale of bonds. "General Obligation Bonds" are most common and involve public agency pledge to pay off bonds over specific period of time using its taxing or other revenue generating powers. Revenue bonds have also used in some cases. Most appropriate for providing major funding for large database and system development efforts, not ongoing operations.
Constraints:	Requires legislative approval and secure pay-back mechanism. Significant administrative overhead in managing bond sales and pay-back.
Frequency/ Importance:	Not extremely frequent for GIS projects but have been a major source of development funding in a number of important cases.

User Fees

Brief Description:	GIS lead agency provides system access and associated support services to user offices and charges fees. Fee may be a fixed "assessment" or "metered use" based on monitoring of usage and tabulation of defined metrics (staff hours used, access to Web-based services, data downloads). User office is "billed" for time and/or system usage based on agreed-upon rates.
Constraints:	Requires formal policy and user-Department acceptance.
Frequency/ Importance:	Used in many cases by government agencies for general IT services and support (charge back arrangements) but used only infrequently for GIS programs.

Standard Public Project Fee or Assessment

Brief Description:	Standard fee assessed and collected from private submitter for infrastructure or land development project (e.g., plan submittal) with justification that GIS supports private sector land development design. This is similar to the use of permit fees but expands this concept to apply a significant but reasonable fee for major development projects.
Constraints:	May require local ordinance or State legislation. Must be placed in special fund designated for use in GIS development and support directly tied to support for private land development work.
Frequency/ Importance:	Infrequent. Could be significant annual revenue source.

Service Agreement to Support Major Infrastructure Development

Brief Description:	Contractual relationship with another public, private, or not-for-profit entity managing a major infrastructure development project that makes use of GIS data and services. The contract would specify specific products and services and terms for providing them in return for payment.
Constraints:	Requires contract and potentially complex negotiations. Legal restrictions or governmental policies may impose limits for entering into service agreements with non-public entities.
Frequency/ Importance:	Infrequent.

Advertising/Promotion/Sponsorship

Brief Description:	Revenue generated through payments or other tangible support (donation of software) by private or other non-governmental organizations in return for a promotional or advertising exposure to a GIS or IT user audience. May include posted logos, links, or pop-up ads on Web pages or sponsorship of events (conferences or training events).
Constraints:	Company promotion through public agency computer networks may be limited by existing policies.
Frequency/ Importance:	Infrequent for IT or GIS organizations with exception of material support for conferences. Used frequently to support government-owned enterprises (e.g., municipally owned zoos, golf courses).

Royalties for Value-added GIS Products

Brief Description:	Revenues based on a percentage of the sale of products or services by Value Added Reseller (VAR) which is licensed to use GIS data from a public agency and which sells products generated from the data based on a mutual agreement.
Constraints:	Requires a formal agreement between the public agency and VAR (usually a private company). May involve legal conflicts (unfair competition) if agreement is exclusive. Success of venture depends on strength of market for custom value-added products.
Frequency/ Importance:	Infrequent use and generally not an important revenue generator. Where market exists, does have the advantage of off-loading risk and product generation, marketing, and distribution costs to an outside party—but means reducing potential royalty revenue to a small percentage of overall sales totals by the VAR.

In addition to the funding sources described above, there are a number of "financial management strategies" that might be used to support the SDI. These are innovative accounting approaches that are subject to particular policies in place and the willingness by senior management and political leadership to apply nontraditional financing and accounting techniques. These approaches, while not routine, are becoming more common for public sector financing of information technology initiatives and other major projects. They include:

- **Reassignment of Unused Funds (aka "diverted reversion"):** Funds in agency budgets that would normally revert and be unavailable at the end of a fiscal year are diverted in whole or in part to IT or GIS investments. Would involve establishing a reserved fund to place the surplus amounts. Most applicable to support clearly defined technology development projects rather than routine operational expenses. Public agency budget policies may prohibit fund carryover or transfer at the end of a FY. Requires formal policy and new accounting procedures for fund transfer.
- **Sale of Intellectual Assets:** Sale of "intellectual property" developed by an IT or GIS organization to other external organizations (public or private). This could include a packaged software product or system application, training materials, or other product that has value to other organizations.
- **Cost Savings or Offset through Staff Resource Sharing/Nontraditional Staff Use:** Not a direct funding source but strategy to save cost for internal staff—mainly administrative or technical personnel. Includes the GIS organization sharing or using staff resources of other organizations without incurring full cost. Also includes use of nontraditional staff resources (temporary, part-time, volunteer, paid student intern). Objective is to provide needed staff resources at costs significantly below full-time employee positions. Policies must be in place that provide for these resourcing options. Student intern programs benefit from local source of skilled students. Operational management and supervision practices must accommodate for nontraditional resourcing approaches.

- **Gain Sharing (aka "benefits funding"):** Portion of increased revenues (or in some cases documented cost savings) resulting from services or a new application provided by the GIS or IT organization is transferred to the GIS or IT organization. Work would be performed with the intent of recovering money or increasing revenue connected with a system, application, or program, based on reasonable certainty that additional revenue can be recovered or generated from GIS or IT services. May be limited by agency budgeting and financial management policies. Requires formal agreement and possible upfront funding to carry out work (public or potentially non-public) program (utility billing, fines, fraud detection, documented cost savings).
- **Computing Infrastructure Sharing:** Strategy for cost reduction and possible revenue through joint use of computing infrastructure or applications with another department, agency, or organization. Cost reduction is possible if the IT or GIS organization is able to use systems (e.g., servers, scanners, output devices) or networks of another agency at low cost (avoiding separate purchase and maintenance costs). Revenue is possible for allowing use of the computing infrastructure or software owned by the IT or GIS organization by another agency for a fee. Dependent on high-speed reliable network links and sufficient computing or network capacity to support joint use. Also requires a formal agreement and monitoring of service.