APPENDIX A

(from RFP for GIS Utility Requirements Analysis and Business Case)

Business Case for a Statewide GIS Utility

Business Case for a Statewide GIS Utility

June 6, 2004

DRAFT

Prepared by:

Geospatial Enterprise Office
Information Resources Management Division
Department of Administrative Services

Table Of Contents

Business Case for a Statewide GIS Utility

Vision Statement

The Geospatial Enterprise Office creates and maintains a statewide geographic information utility to support a broad range of planning, assessment and analysis requirements. This utility serves governments across program, agency and jurisdiction boundaries to provide data and tools that improve emergency response, environmental protection, social services and economic development.

Request

Provide funding to support the first three phases of building the Statewide GIS Utility. The Initiation Phase (project plan, assessment, requirements and design) is estimated to cost $400,000. The two Project Phases (data collection, infrastructure, prototype and pilot projects) are estimated at $29.6 million to be spread over four years. The Program Phase (data maintenance and ongoing operations) is estimated at $2.5 million per biennium.

Requested by: Geospatial Enterprise Office, IRMD, Department of Administrative Services, on behalf of the Governor's Oregon Geographic Information Council.

Metrics

- Funding multiplier of 6:1* by: Annually
- High priority data layers completed by: Dec 2006
- All data layers completed by: Dec 2008
- Hardware/software infrastructure complete by: Dec 2006
- Project complete by: Dec 2008
- Partners in GIS Utility
  - 50 State by: Dec 2006
  - 10 Federal/tribal by: Jun 2007
  - 200 Local/Regional by: Dec 2007
  - 30 Private/Academic by: Jun 2008
  - 100,000 users of utility by: Dec 2008
- 4:1 dollar savings by: Dec 2010

* Ratio based on actual results achieved in current biennium.

Benefits

GIS is a very effective tool for evaluating and showing relationships between features (such as roads, streams, zoning, parcels, street address, municipal boundaries, and schools), and occurrences (such as wildfires, salmon habitat, commercial development, drug arrests, chemical spills, and child abuse) that can be mapped. When complete, accurate, updated data is on hand, GIS has been proven to provide benefits when used in daily business functions. The most notable of these benefits include:

- State, local and federal agencies are better able to respond to geographically related issues including: emergency response, environmental preservation and response, tax reporting, urban development, regional planning, and health and welfare analysis.

- Economic opportunities are increased when current local data is available from a single source to support tourism, industrial site location, and new and existing business development.
- Planning, applying and monitoring environmental and recreational projects, such as the Willamette River Legacy, are improved by using geographic data from many sources.
- State, local, and federal agencies can work together to plan and implement social programs more effectively, and improve children's lives, when they can share geographic data about the distribution of wealth, services, and opportunities.
- Efficiencies from data sharing and joint programs reduce costs.
- Data management is improved (greater accuracy, less expensive, standardized).
- Decision support (timeliness and data content) is improved.
- Resources are saved across all levels of government due to data integration. The cost and resource savings enabled by the GIS Utility could become an important part of state fiscal reform.
- Improved citizen satisfaction with government due to enhanced service levels (both a greater amount of service and faster responses).

Key Assumptions

Benefits

A study of 50 different groups in the U.S. and Canada quantified the benefits of GIS to those groups. The study found that creating a system where geographic information can be shared among different organizations will generate a 400 percent return on the investment (benefit-cost ratio 4:1). The literature contains many other examples in which organizations have documented a 4:1 or greater return on investment from systems similar to the GIS Utility proposed here.

The diagram below illustrates the projected 4:1 return on the proposed investment. The projected benefits and costs in the diagram are cumulative. The timing of the benefit stream is based on studies of projects in other states that indicate that the benefits begin to accrue at an increasing pace as more data becomes available, and that benefits exceed costs before the data development is completed. A more detailed discussion of benefits is included in Attachment 1.

Leveraged Funding

The total cost estimate for the GIS Utility is around $200 million. This business case requests $30 million. Experience with prior projects managed by GEO indicate each dollar invested attracts roughly six additional dollars to the project. Thus, the $30 million invested by the State would yield slightly more than the required $200 million.

Costs

The data development costs for Phases 2 and 3 are based on results of Oregon pilot projects done for the purpose of data layer cost estimation, a statewide data survey conducted in April 2004, and costs for similar data development efforts in other states. The Phase 4 program costs for the GIS Utility are projections based on existing staff costs, projected staffing levels, software costs, services and supplies, and data center hosting services for the Geospatial Enterprise Office.

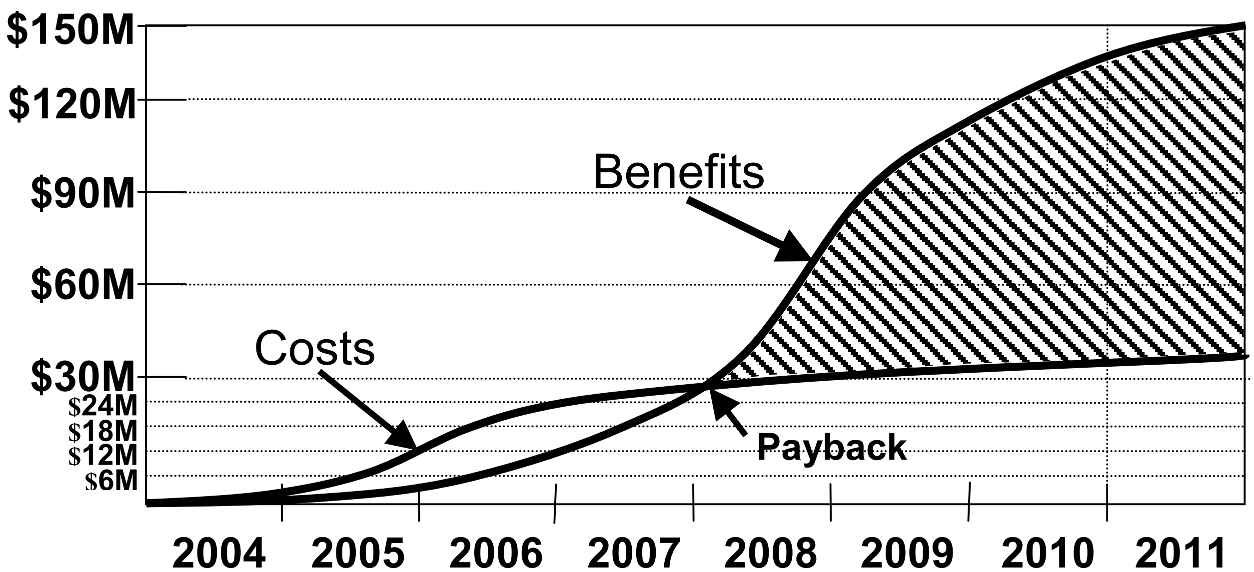
Schedule

The timeline for completion of Phases 2 and 3 is based on the results of the data layer cost estimation pilot projects, and assumes that the current rate of development can be accelerated with additional resources.

Costs by Phase

High Level Cost Estimates by Phase		
Phase	**Activity**	**Cost**
Phase 1	Initiation & design	$400,000
Phase 2	Data dev. & prototype	$18,000,000
Phase 3	Data dev. & pilot	$11,600,000
Phase 4 (Program)	Move to program	$2,500,000 per biennium

Benefit Accrual Estimate



Schedule by Phase

High Level Schedule Estimates by Phase		
Phase	**Begin**	**Complete**
Phase 1	June 2004	December 2004
Phase 2	January 2005	December 2006
Phase 3	June 2005	December 2008
Phase 4 (Program)	January 2005	Ongoing

Risks

Risks to this effort are defined as "an uncertain event or condition that, if it occurs, has a negative effect on a project objective".

Risk	Likely to Occur	Severity	Risk Factor	Mitigation
Underestimate costs and effort	4	5	20	Assessment phase will provide detailed cost estimates and project plan.
Insufficient project management resources within GEO	4	4	16	Project management resources need to be acquired to provide structure and oversight.
Insufficient fund leveraging	2	5	10	During assessment phase, GEO will revisit agreements/understandings with cooperators and re-plan leveraging strategy.
Agency support falters	2	5	10	Communication and marketing plan to develop shared goals and shared solutions.
Proposed Governance Model unworkable	2	4	8	Collaborative modification of governance model by stakeholders

Values range from 0 (will not occur/no impact) to 5 (will occur/severe impact).

Summary

A utility generally refers to a basic public service provider that is given special regulatory status in exchange for satisfying consumers' best interests outside of the traditional market economy. There are many ownership styles for utilities, including government-owned, non-profit, co-operatively owned, or a combination of these. Utilities traditionally provide water, energy, transportation, or telecom services.

GIS base layer datasets, the technology to provide access to those data, the coordination and communication efforts necessary to develop, acquire and maintain those data, and to some extent the skills by which those data are manipulated in support of decision-making, can be considered a public utility in the sense that:

- The acquisition and maintenance of this data is both expensive and in the public interest,
- The distribution of those data must be as widespread as possible so as to support an informed citizenry and executive decision-making, and
- Comparable data sets are unavailable, outdated, or prohibitively expensive in the private sector.

The fundamental business case for developing a GIS Utility as quickly as possible is four-fold:

- A GIS Utility directly enhances government services that improve health, safety and welfare of Oregonians;
- The creation of a GIS Utility versus traditional GIS models reduces the time and cost needed to provide these important services;

- A GIS Utility increases inter-jurisdictional cooperation among member agencies; and,
- A GIS Utility pays for itself through extensive productivity gains, streamlined processes and cost avoidance from eliminating duplicated effort.

The GIS Utility described here is estimated to cost a total of $200 million. The funding requested in this proposal will be leveraged to acquire local and federal funds to complete development. This proposal requests $30 million in State funding. The first phase of the program will require roughly $400,000. The second phase of the program will require roughly $18.2 million. The third phase will require roughly $11.8 million, with about $2.5 million per biennium in ongoing costs.

To fully realize the value of this $30 million capital investment, GEO expects to leverage $180 million from federal, regional, local, tribal, and private investment in GIS data development. Leveraging will occur through the joint development of GIS data layers. The existing coordination structure in Oregon, including the Framework Implementation Teams, the GIS Program Leaders, the ORMAP Technical and Advisory Committees, the Oregon GIS Association and other staff resource and funding investments will be realigned to emphasize the timely development of high-priority GIS data layers and reduce duplicate investments. The process of deciding how, where, and when these data development efforts are done involves timing and teamwork at all levels of governance. Cooperative investment requires joint prioritization, and thus relies on available funding to move forward.

In the prior biennium, state agencies supported a $500,000 data development fund. With OGIC oversight, this money was spent to develop aerial imagery, elevation, hydrography, and transportation data sets. The OGIC fund spent around $150,000 to acquire approximately $1.1 million worth of imagery. Through local and federal investments, a 7:1 leverage of state funds was achieved for this data set. Similar joint investments last biennium by local, regional and federal agencies provided roughly a 6:1 leverage of state funds for the entire OGIC data fund.

The Oregon Geographic Information Council recommends, on the basis of this business case, that the Geospatial Enterprise Office be provided a stable, long-term funding source to collaboratively complete and maintain the GIS Utility. It also recommends that the coordinated approach for the development, maintenance, management, and distribution of GIS information and analysis be adopted as fundamental to the concept of the GIS Utility.

Relationship to GEO Business Plan

The current Geospatial Enterprise Office (GEO) Business Plan describes the working environment for four staff members within the DAS Information Resources Management Division. These personnel are funded through a statewide agency assessment.

The GEO Business Plan has focused on supporting shared data and network infrastructure resources, the creation of geospatial data and interoperability standards, and improved access to the data in the Oregon Geospatial Data Clearinghouse (OGDC). It has been aimed at a deliberate and coordinated but voluntary development of the GIS Utility concept. However, the development of statewide geospatial data, which is the foundation of a GIS Utility, will take too long under this voluntary participation model.

This new business case fundamentally shifts the GEO Business Plan to a more active data creation, management and distribution role and affects its basic governance model.

GEO is revising its business plan to reflect a move towards a shared services model. This model means that the GEO program will be responsible directly to its customers through a governance board made up of its customers. The service that is to be shared is the GIS Utility described in this business case.

Success Factors

The GIS Utility will be successful as a result of many factors that interrelate and reinforce each other. Organizations that participate will realize significant benefits from the use of GIS technology in concert with the GIS Utility data and services. Success factors include the following:

- Reduced costs for data analysis
- Improved data quality and reduced data conflicts
- Improved and faster data analysis
- Improved support for cross-jurisdictional decision making
- Reduced project costs through collective bidding and leveraged technology
- Shared system use by multiple levels of government
- Improved customer service and increased citizen impact through direct participation
- GIS Utility program aligned with Oregon IT strategy

Background

Every day, police officers are dispatched to stop crimes in progress and help citizens in need. Firefighters and emergency medical personnel work to put out fires respond to health emergencies. State and local health services run daily operations to identify, track, and mitigate life-threatening diseases. The state departments of transportation and police, as well as local authorities, respond to auto accidents, keep roads safe and analyze accident patterns to develop strategies that reduce injury and death. All of these operations have two things in common.

- They are responsible for saving lives and property each day;
- They rely on information with a geographic component that is critical to their success.

Although it is often not recognized, every government agency relies on geographic information to either fulfill their mandate or measure the success and distribution of their efforts. Environmental quality is measured in specific locations, taxing districts vary across the terrain and by administrative jurisdiction, commercial and residential development occurs differently in various places based on regulations and access to services. These more mundane day-to-day activities are in sum as valuable as the lives and property they impact, serve, and protect.

Geographic data, when combined with existing communication and analysis technologies, can support the foundation of a modern information infrastructure. This infrastructure could support almost all of the functions for which government is responsible. Use of geographic data and technology has been proven to increase workforce productivity, streamline business processes, save money, and improve services to the public. For example, the City of Lincoln, Nebraska applied GIS to crime statistics and reduced crime in target neighborhoods by 67 percent in seven weeks. Martin County, Florida applied GIS to cell phone tower inventory data and increased tax revenue by $3.5 million. Washoe County, Nevada applied GIS to improve major capital investment decisions made by the County Commissioners and achieved an upgrade in its bond rating. The Wisconsin Public Service gas and electric utility implemented a system-wide GIS that cost $5.4 million and is used to manage all facilities in their 12,500 square mile service territory. An internal audit determined that the system has generated net annual savings of $2 million, and that the breakeven point was reached before data development was complete.

The Oregon Geographic Information Council (OGIC) consists of 23 State agencies, four local government and two federal representatives. For the past three years, OGIC and state agencies have supported statewide coordination of geographic data and technology through an assessment based on agency size and the relative importance of geographic information to the agency's mission. Some of that assessment has been spent on managing and improving the Geographic Data Clearinghouse, while $500,000 has been spent creating data that would otherwise have been duplicated by agencies. These data creation funds have been increased six-fold by leveraging them with other state, federal and local money (total investment of $3 million). This represents a minimum savings of $2.5 million for state government in cost avoidance. The value of the data created in this single effort is estimated at $43 million, based on the total cost of the data and the number of user agencies that would normally have duplicated the effort. This yields a conservative return on investment of 14:1 and an overall government cost avoidance of around $40 million. This estimate does not include all the agencies and citizens that can use this data to make better decisions, but would not have developed it on their own.

At the present rate of investment ($3 million/biennium for all partners), it will take 120 years to complete the $200 million data development for a GIS Utility. Very few investments have been made for putting the technology in the hands of government agencies that need it. No investments have been made in technology that would enable access to data across local and regional governments, state and federal agencies and academia.

Based on previous investment leveraging and expression of interest in the GIS Utility concept, and based on the alignment of this utility with the business processes and priorities of all the government agencies in Oregon, the State has an opportunity to leverage more funds from federal, regional and local sources to complete the development of the data infrastructure and begin realizing the benefits of a statewide GIS Utility much sooner.

Project Requirements

Assessment

The first task is to determine requirements through an assessment of the current situation relative to a GIS Utility. This includes a description of the current technology environment, an existing and planned base data inventory, a human resources inventory in terms of GIS skills and availability in government agencies, an applications inventory, and an accounting of current GIS data expenditures. This inventory will be done at all levels of Oregon government to get a complete picture of the current and needed infrastructure. The cost of doing the inventory and assessment will be roughly $400,000. The inventory and assessment tasks would be completed during Phase 1, and would drive the rest of Phase 2 development, as well as Phase 3.

Coordination Effort

Coordinated and collaborative effort is a foundational component of the GIS Utility. The OGIC organization is a critical part of making it all work. Coordinated management of data will increase the likelihood it will be seen as a government asset in its own right, ready for use in any program or project that might benefit from its use. It will also increase the potential to link geographic data to many other data types maintained by any level of government. A coordinated approach to the management of geographic data enables:

- Timely availability of maps and related information
- Integration of maps and geographic data with related tabular databases
- Maximized use of geographic data assets throughout the state
- Data maintenance in accordance with accepted standards, resulting in high data quality
- Coherent maintenance and development of GIS capabilities in response to developing technology and agency business needs

Communication between all partners in this program is an essential element. Each element of the base data is interconnected. The partners developing these data sets must know and understand what all other partners are doing. The coordination, collaboration, and communication necessary for the GIS Utility development is included in the cost of development indicated above. The timeframe for this effort is concurrent with the data development timeline.

Data Creation Effort

The GIS base data development will be funded and completed in phases, with the highest priority data being developed first to begin accruing benefits as quickly as possible. The highest priority data elements within each base data layer are listed in Attachment 2, along with an estimate of the current status of the layer, the timeframe for completion if funding is approved, and the State portion of funding needed. Some high priority data is not included in this list because the complete data set is already available. It is important to remember that this effort is also building the means for maintaining the statewide GIS base data. Without that component, the initial data investment will be wasted.

The federal Office of Management and Budget has estimated that local and state governments spend more than $8 billion annually on collection and management of GIS data. Based on our share of the national population and land area, Oregon spends at least $160 million dollars each year creating and using geographic data. Hundreds of groups across the state do this to meet their individual business needs. Yet, most of these government organizations in Oregon still do not have the information they need to solve critical problems. There are several issues:

- Most groups need more data than they can afford. Often, large amounts of money are spent on base data, leaving little for application data and development. Some groups cannot afford to collect base data at all.

- Groups often need data outside their jurisdictions or operational areas. They do not collect these data themselves, but other groups do.

- Data collected by different organizations are often incompatible. The data may cover the same area but use different bases and standards. In addition, information needed to solve cross-jurisdictional problems is often unavailable.

The GIS Utility will greatly improve this situation. It will provide basic geographic data in a common format that anyone can use and to which anyone can contribute. Users can then perform cross-jurisdictional and cross-organizational analyses, and groups can funnel their resources into applications, rather than duplicate data production efforts. These cost savings are one of the primary factors in the three to four year payback period estimated in this business case.

Hardware/Software/Network

The GIS Utility needs technology that provides direct, interactive access to dispersed data sets, removing the need to centrally store the data. This requires a virtual data repository using middleware tools to manage data access and documentation. Users of the GIS Utility application will be able to access the data through a web page at their desktop. As the user navigates through the application, it will appear to them that they are looking at a single collection of data layers stored centrally.

In reality, they will be working with software that looks up the correct documentation and location for each data set. The middleware connects to each of the data provider sites (state agencies, local governments, federal agencies, etc.), which process the query and package and return the response. The middleware groups all of the responses into a single response to the user. This technology is in prototype, and has been tested successfully by the GEO team. The prototype connected to a local government, a state agency, and a regional transit authority to prove the viability of the concept.

The GIS Utility also requires technology for the partners in this effort. Many of those partners, mainly at the local level, may require hardware, software, and telecom upgrades to fully take part in the distributed data creation and sharing. The cost of applying the technology at various levels of government is estimated to be around $2 million in Phase 2 of the project. The initial enhancements would be done in the first two years of Phase 2, being completed by December 2006, with maintenance and replacement cycles in Phase 3.

Staffing

Staffing for GEO will include the existing staff resources for Phase 1 and the beginning of Phase 2. Gradually, additional positions will be needed to handle the added workloads and improved functions that the Phase 2 and 3 data development efforts will require. Staffing needs will be:

Current – four FTE:

- Statewide GIS Coordinator – Enterprise coordination efforts related to GIS technology policy and issues; enterprise GIS strategic planning and implementation; primary representative for Oregon's GIS community; supervises section, develops budget; staffs Oregon Geographic Information Council
- GIS Business Analyst – Enterprise coordination efforts related to development of GIS technologies within state and local governmental agencies; staffs Framework Implementation Team and GIS Program Leadership groups
- Data Administrator – Enterprise GIS data administration activities (including data acquisition, management, and access)
- Web Administrator – Enterprise website administration activities (including webpage and interface maintenance and improvements)

GIS Utility – 10 FTE:
Staffing needs for the GIS Utility will increase over the course of Phases 2, 3, & 4. As the base data layers are completed, it will be necessary to provide access, manage the processes for keeping them current, and provide technology support for data distribution, security, and performance. At first, some of the activities outlined below could be covered by current FTE, but expected growth will eventually require up to six more FTE in three main areas: application administration, outreach, and data coordination.

Application Administration:
- ArcIMS – web interface to geographic base data, customized access to data (map services and feature services)
- ArcSDE/Oracle – optimization of data structures and indexing for geographic data stored centrally
- Middleware (e.g., Xmarc, Cartalinea, Freelance or other) – security and interface controls for accessing distributed databases and structures (spatial and non-spatial)

Outreach Coordination:
- Local (County & City) – data and technology
- Regional (councils and federal) – standards and stewardship

Data Coordination:
- Development and maintenance of coordinated and integrated framework data in support of government activities at all levels (local, regional, tribal, county, state, and federal)
- Staff to the NSDI/FGDC Framework Implementation Team and its subcommittees.

Administrative Support
- Facilitation of section/group tasks related to day-to-day support functions.

Project Phase Details

As with any project, details become less clear the further in the future the activity will take place. As a result, there is much more detail for Phase 1 than Phase 4. The project team will create a detailed Project Plan at the end of Phase 1, which will be updated at the end of Phase 2 to provide more detail for Phase 3 and the ongoing program.

Phase 1

Phase 1 is the Project Initiation Phase. Phase 1 will consist of the following high-level tasks:

- RFP development and procurement of contractor support for assessment effort
- GEO creates requirements document in conjunction with OGIC.
    - Deliverable: GIS Utility requirements document
- Contractor assessment of technology infrastructure
    - Deliverable: inventory report (hardware, software, applications, staffing, other)
    - Deliverable: technology gap analysis and cost estimate
    - Deliverable: recommendation on minimal and optimal technology required to support the central GIS Utility functions
    - Deliverable: recommendations for minimal and optimal technology for effective end-user use of the GIS Utility
    - Deliverable: recommendations for process/technology changes required at distributed locations to support Framework data stewardship
- Contractor assessment of existing data sources and agreements
    - Deliverable: inventory report (data source, application alignment w/data source)
    - Deliverable: data gap analysis and cost estimate
    - Deliverable: recommendations on data maintenance agreements
    - Deliverable: recommendations on process changes required for Framework data stewardship (either centrally or in distributed fashion)
    - Deliverable: recommendations on GIS-related application consolidation or use of common GIS-related applications to replace current redundant application use
- Contractor/GEO design of GIS Utility system
    - Deliverable: GIS Utility system design document for review/approval by OGIC (broken down by central/state and non-state/local improvements needed)
- GEO assessment of cooperative agreements and ability to leverage funds
    - Deliverable: Plan for data cooperation and signed agreements with data partners
- Contractor assessment of project and program risks
    - Deliverable: Project and Program Risk Assessment and Mitigation Plan
- GEO/Contractor Project Plan for Phases 2 and 3
    - Deliverable: Phase 2 and 3 Project Plan
- GEO/Contractor GEO Staffing Plan for Phases 2, 3 and 4
    - Deliverable: GEO staffing plan for the project and ongoing program
- RFP development and procurement for contractor support for Phase 2 and 3 technology infrastructure and data development
- GEO/Contractor Business Case Refresh/Update for Phases 2, 3, and 4
    - Deliverable: Updated business case for Phases 2, 3, and 4
    - Deliverable: Plan for proving/delivering the business case

Phase 2

Phase 2 is the High Priority Data Development Phase. This phase also includes introduction of some of the technologies required for the GIS Utility model and the creation of a prototype system. High-level tasks for Phase 2 are:

- Contractor/GEO identify business process improvements (BPI) needed for data stewards to be successful
  - Deliverable: Document describing BPI needs at agency level (or centralized solution for data stewardship)
  - Deliverable: Communication document outlining options for BPI
- Contractor/GEO create and/or acquire 14 highest priority data layers
  - Deliverable: 14 data layers completed to OGIC standards
  - Deliverable: Data dictionary (metadata) for all layers completed
- Contractor implement technology upgrades for limited number of high interest partners
  - Deliverable: At least one partner from each of local, state and federal government has the ability to use the utility
- Contractor creates prototype application for review by partners and OGIC.
  - Deliverable: Prototype and documentation of functionality and limitations
  - Deliverable: Recommendations for implementation on a utility-scale basis
- Contractor/GEO define pilot application project(s) with local, state and federal partners
  - Deliverable: Pilot project plan(s) for Phase 3
- GEO update contractor Statement of Work for additional data development and acquisition in Phase 3, and include contractor support for pilot project
- GEO/Contractor Business Case Refresh/Update for Phases 3 and 4
  - Deliverable: Updated business case for Phases 3 and 4
  - Deliverable: Document Phase 2 results & update the plan for proving/delivering the business case

Phase 3

Phase 3 is the Final Data Development and Pilot Project Phase. This phase will complete the base data development and demonstrate use of the GIS Utility applied to an actual project.

- Contractor/GEO complete creation and/or acquisition of final base data.
  - Deliverable: Remaining data layers completed to OGIC standards
  - Deliverable: Data dictionary (metadata) for all layers completed
- GEO applies utility data and technology to pilot application project in cooperation with selected agencies
  - Deliverable: Pilot project report, including lessons learned
- GEO/Contractor provide recommendations for program operation
  - Deliverable: Updated GEO Business Plan
- OGIC provides confirmation that the project has met their expectations and that the GIS Utility is ready to move to program mode
  - Deliverable: Project completion formed signed by OGIC members

    - Deliverable: Document committing OGIC to supporting the GIS Utility program, both financially and organizationally.

- GEO/Contractor Business Case Refresh/Update for Phase 4
    - Deliverable: Updated business case for Phase 4
    - Deliverable: Document Phase 3 results & update the plan for proving/delivering the business case

Phase 4 (program)

Phase 4 is an exit from project mode and a move to program mode. General tasks for Phase 4:

- Formalize the governance model for GEO and the GIS Utility
- Identify required staff and training, both for GEO and for partners
- Create a long-term plan for data creation, acquisition, stewardship, and maintenance
- Create Service Level Agreements with partners and users
- Create a plan for a long-term sustainable funding base, including reduction in state funds

Policy Issues

There are a number of policy issues that will have an impact on the development of a GIS Utility. These issues must be addressed as early as possible in the development process. The policy issues are discussed below.

Organization and Governance

The governance structure under which GIS is coordinated and managed will need to be revised. This is a complex issue that includes relations between state, federal and local governments. It may not be possible to follow a strict "shared services" governance model, but the current governance must change.

In a shared services model, a governance board of involved agency directors will lead the early phases of development, including planning and assessment. For later phases, a shared services board comprised of directors of member and customer agencies will replace the governance board. This board will oversee the success of the GEO Business Plan, set the GEO budget, and decide which services are provided at what cost. GIS experts from agencies on the shared services board will provide technical advice. This shared services model will likely be applied to a variety of services in Oregon as that concept becomes more mature in state government.

The Oregon Geographic Information Council (OGIC) could be mandated to serve as the governance or shared services board for the GIS Utility, with some adjustment to its current structure and membership. The details of this model will be finalized during the first phase of GIS Utility development.

Prioritization Process

The GIS community in Oregon has determined which data layers should be developed first. If this business case is approved, the project planning, assessment and design that occurs in Phase 1 will include a more detailed review of the best timing for the development of each data layer. This process will focus on getting the highest possible return on investment at the earliest possible date.

Data accessibility

There is a range of legal and administrative constraints to data sharing that have been put in place over time to support specific business practices. These issues include privacy, security, confidentiality, licensing, cost recovery, public information laws, liability, data documentation, copyright, and maintenance funding. In some cases, data of value to the GIS Utility is not public domain data, so the issue of licensing non-public data will have to be addressed. The OGIC is attempting to reach consensus on a broad policy that would address all of these issues. Any such policy proposals will affect all levels of government and may need to be addressed by the Legislature and other governing bodies.

Standardization

Standards are vital to the success of a GIS Utility. For data sharing to work, there must be agreement on data format, structure and data collection protocols. These standards are slowly emerging through the efforts of OGIC and GEO, but that work and adoption of data standards must be accelerated.

The key obstacles to the quick adoption of standards are current business processes and rules within each government agency. Each legislative mandate has been satisfied with an agency business focus. The regular exchange of GIS data between agencies has not been one of those mandates. Without a quick commitment to standards for the creation, maintenance, and distribution of GIS data, agencies at all levels of government will continue duplicate data development efforts. Standards will allow government to develop data once and use it many times for many purposes.

Open software standards may in time make GIS software issues less of a problem, but for the near future the state will be required to develop the GIS Utility on proprietary software used by most of the likely members. GEO is exploring strategies to offer the most cost-effective means of providing and maintaining this software for all members. A major goal is to make the data available to users through a simple Internet browser.

Roles and Responsibilities

<u>Governance board</u>: The governance board will be responsible for deciding the best roles, responsibilities, products, services and rates for the GIS Utility.

<u>GEO</u>: GEO would manage the shared GIS data library and coordinate the maintenance of the data with agency data stewards. GEO would constantly improve access and distribution methods to make the data more useful and accessible by the user community. GEO would also provide quality control over the data stored in the data library. GEO will continue its strong coordination role, with the Statewide GIS Coordinator and staff organizing the actions that are required to reach the highest and best use of GIS data for the State. These efforts reduce or eliminate duplicated effort as agencies at all levels of government can use the GIS Utility's shared resources with their own data and analytical tools to address their business needs.

<u>Data Stewards</u>: The stewardship of statewide data layers, such as roads, tax lots, and streams, will be performed by appropriate state or federal agencies as part of the business processes of those agencies. Data stewardship will involve integrating data sets from many other organizations to form a complete statewide data layer, ensuring that the data meets quality and accuracy standards, and coordinating with GEO to make

the data accessible to all appropriate organizations and the public. For some data layers, such as administrative boundaries, aerial imagery, cultural features, and others, GEO will perform the stewardship tasks. All data stewardship activities performed by other organizations will be coordinated by, and conducted under an agreement with GEO.

Other organizations: Services such as providing map products, data analysis, data integration, and other value-added services that use the shared utility data will be provided by the private sector, academic institutions, regional governments, or other quasi-public entities, such as the Natural Resources Institute or Inside Oregon Enterprises. These services will be coordinated and facilitated by GEO.

Funding

Mission-driven funding, as described in Attachment 4, would be the most appropriate method to fund the GIS Utility. The data and technology will be beneficial to nearly all government business processes, but there are a few government functions that will benefit the most. Those include emergency response and public safety, real property management and taxation, transportation system development and maintenance, and environmental management and monitoring. The Oregon Geographic Information Council should be tasked with making specific recommendations for the best mission-driven funding approaches.

Supplement A

Detailed Benefits Discussion and Examples

There are many situations in which the GIS Utility will help users. Below are four examples of progress that could be made with a complete, actively maintained GIS Utility. Each example begins with the current situation and approach, and then looks at a new approach assuming the GIS Utility has been developed and is maintained regularly.

Scenario 1 – Economic Development

<u>*Situation*</u>

Many agencies in local and state government are striving to improve economic conditions. In Oregon, economic conditions are closely linked with sustainable communities and a healthy environment. To promote these conditions, local and state officials must have access to a wide variety of detailed economic, human resource, and natural resource data. There are a couple of key activities with which local and state government can help. One of these is attracting new business to Oregon, and specifically to Oregon communities. The other is growing and nurturing the businesses that already are here.

Improvement of the economic climate in Oregon, by making Oregon a more attractive place for businesses and growing the existing economy, is one desired outcome. Also, it is desirable to promote the sustainable growth of the economy along with protection of the environment.

<u>*Current Approach*</u>

Officials in various agencies and at different levels of government work fairly independently to tout the virtues of Oregon and to attract targeted businesses to the state. Businesses currently can use the web to gain some limited information about particular sites, but not to query that information to find out about specific situations or criteria of their choosing that would make a particular area or site valuable for relocation or expansion of their business.

The website, Oregonprospector.com, provides very crude mapping capabilities using commercially provided maps that are typically outdated. The application has very limited functionality in terms of querying data, and does not appear to provide access to locally provided data that would be useful to a business attempting to make decisions and choices between location alternatives.

The vast knowledge base about Oregon businesses is scattered among various agencies. Agencies often have difficulty sharing information because of a lack of standardization and lack of a base data layer to use as a common reference.

Identifying, locating, acquiring, and integrating suitable data for economic development purposes is very costly to the agencies involved and has to be repeated regularly. When data is not available economic development activities are not as effective as they would otherwise be, which results in loss of potential businesses to other states, failure of existing businesses, and a declining economy. In the case of Oregonprospector.com, a single agency is forced to use outdated, commercially available data rather than accurate, locally provided data. This will likely result in frustration by users and loss of potential business.

<u>*Utility Approach*</u>

Economic development officials and others from all agencies, local and state, have access to the same basic data anywhere in the state. Transportation options, utilities, health care facilities, property tax information, schools, etc., are included in the virtual statewide database comprised of multiple distributed data sources. Address data is integrated with road data to provide a way to locate information about specific sites that are designated as 'buildable' or 'shovel-ready'. Information about communities, facilities, and amenities surrounding such sites is available.

The data can be used interactively from any web browser, so that economic development officials or businesses do not have to download the data. However, the data can be downloaded via the web if needed. An application helps to locate buildable sites based on criteria entered by the user regarding the type of location desired, the location of facilities and utilities necessary for a certain business, the location of potential employees, the availability of services for employees, the property tax situation, local zoning ordinances, nearness to transportation options, and other factors.

EXAMPLE: The State of Virginia - A significant portion of local government responsibilities (economic development, emergency preparedness and response, transportation planning and resource protection) require communities to access and work with data from outside their jurisdictions. An example of the cooperative use of GIS technology is the Virginia Economic Development Partnership's "VirginiaScan" website, which lets anyone with an Internet connection and a web browser research available land, buildings, and communities throughout Virginia for business siting or relocation (http://www.yesvirginia.org/site_selection/vascan.aspx). This website is fed by updated local and state data on a regular basis, preventing duplication of effort and providing a single, easily accessible place to find a variety of information.

EXAMPLE: Vallejo, California. Developed a GIS-based Internet site that supplied information on available commercial and retail buildings, land, traffic counts, and demographics. Retail vacancy rate was reduced 45.3 percent from 1998 to 2000 after the site was introduced.

Scenario 2 – Public Safety

Situation

Units from local, state, and federal agencies must respond to wildfires every year in Oregon's forests. The wildland/urban interface is rapidly expanding, putting more lives and property at risk from wildfire. Responding to wildfires is dangerous business, requiring accurate information about the location and direction of the fire, as well as the location of people and structures in the path of the fire.

The best routes for evacuation and moving firefighting equipment must also be available to first responders. Locations of utility facilities (power lines, phone lines, cell towers, gas lines, etc.) should be easily accessible to responders to aid in protecting those features, and the responders themselves.

Current Approach

During the 2002 fire season, firefighters in some areas were able to combine their efforts and data to identify individual homes threatened by fire and the best route to travel to each one. But in most parts of the state where wildfires are likely to occur, the data either doesn't exist or is very difficult to integrate. Without this data and the coordinated effort to use it quickly, lives and property may be lost. The locations of electrical facilities and other utilities are not easy to find and have to be sought from various providers. The same is true of water sources for firefighting. When wildfires cross county boundaries, the task of data collection is even more difficult.

Identifying, locating, acquiring, and integrating base data for wildfire response is very costly for the agencies involved and must be repeated each fire season. When the base data is unavailable, as is the case in many parts of the state, response activities are not as effective as they could be, which results in much greater costs and potentially greater risks in protecting structures. There are further impacts related to insurance costs when lives and property are lost.

Utility Approach

The response units from all agencies have access to the same base data wherever wildfires are likely to occur. Locations of dwellings and other structures can be readily identified on updated aerial photography. All road data exists within the same data set and is properly registered with the aerial photography so that federal roads, state highways, county and city roads can all be accessed by response units for routing equipment and planning evacuations. Address data is integrated with the road data to provide exact locations of structures and provide contact information.

A web site providing firefighting analysis tools is accessible by wireless connection. The data can be downloaded if necessary for use in the field. A web application allows response teams to update databases in real time regarding the location and movement of wildfire boundaries, the location of equipment, and the status of the overall effort. Web applications allow real time simultaneous status map updates to response teams in different geographic areas, allowing central command to effectively deploy resources.

First and foremost, lives are saved since the response teams have the information they need to respond at the right location at the right time. Loss of property, and the costs associated with such loss, is also diminished or avoided altogether.

EXAMPLE: Wasco County, Oregon – During the 2002 fire season, the Sheldon Fire threatened hundreds of homes in Wasco County. GIS staff in Wasco County and the Oregon Department of Forestry (ODF) were able to combine their data to identify individual homes threatened by the fire and the best route to travel to each one. Structural fire fighting units were assigned to protect the homes and buildings, and wildland firefighters were assigned to the forested areas. As a result, only one structure (a pole barn) was lost even though the fire burned through several housing areas and threatened more than 40 structures. This alone saved Oregon residents and businesses millions of dollars. One can only speculate as to the potential for lost lives in the absence of the GIS information. “You do not know how much the information helped. The structural teams knew exactly where to go!” – Larry Hoffman, ODF Forest Unit Supervisor.

EXAMPLE: Lane County, Oregon – While identifying water sources in preparation for future firefighting activities, a helicopter crashed in the fall of 2003, killing both the helicopter pilot and an ODF spotter. The helicopter clipped a power transmission line and crashed into the Siuslaw River, causing about 4,000 members of the Lane Electric Cooperative to lose power. From the perspective of GIS information and public safety, the location of the power transmission lines in relation to water bodies may have prevented the crash, the loss of life, and the loss of power to rural electric customers in Lane County.

Scenario 3 – Health and Human Services

Situation

Health officials want to recognize the outbreak of an epidemic, such as influenza, very early so the public can be warned and the most at risk citizens can be protected. However, early warning signs are not easy to detect, chiefly because the data that contains such signs is scattered across many institutions and held in numerous databases.

Health officials must have access to current data from all health providers in a certain region to detect early warning signs of epidemics. Ideally, this information would contain the address for each patient (diagnosis) so that epidemic signals can be tracked by location. If a particular area appears to be the location where an epidemic is beginning, the most susceptible citizens in that area could be identified and warned to take appropriate measures.

Current Approach

The approach to epidemic recognition in most parts of the state involves a gathering of data from hospitals or clinics, usually after the epidemic is already gaining force. Plotting the data on maps containing base data as reference points to recognize patterns is usually not done because the base data is too difficult and costly to gather for such singular purposes.

Identifying, locating, acquiring, and integrating appropriate base data for epidemic recognition would be very costly to the agencies involved and would have to be repeated on a regular basis. When the base data is unavailable, as is the case in many parts of the state, epidemic recognition is not as effective as it would otherwise be, which may result in loss of life for those citizens at greatest risk. In the event of bioterror threats, the ability to plot disease occurrences in relationship to infrastructure data to detect patterns is the only means by which such attacks can be recognized and a response mounted.

Utility Approach

Health officials from all agencies, local and state, have access to the same base data anywhere in the state. Locations of hospitals, clinics, nursing homes, and schools are included in the statewide database, including information about the capacity of those facilities. Address data is integrated with road data to provide a way of locating occurrence of disease. Health officials can combine emergency room diagnoses from regional hospitals and clinics, and information from local pharmacies related to purchase of over-the-counter medicine such as flu medicines. This data is then integrated with basic data from the GIS Utility to provide maps and charts helping to visualize patterns that may be the very early indications of an epidemic or bioterror threat.

A web application allows health officials to update databases in real time regarding the location and pattern of epidemic indicators, the location of potential facilities and their capacity and equipment on hand to deal with an epidemic, the location of vulnerable populations, and the status of notification efforts and disease progression.

An Internet site provides tools to access the needed data, query and analyze the data, integrate the base data with detailed data about emergency room diagnoses, hospital and clinic locations and capacities, and locations of schools and nursing homes and their capacities. The tools also allow visualizing the data via maps and charts and seeking assistance from other experts. Web applications provide real time status tracking of epidemics, hospital and equipment location, vulnerable population locations, and notification and treatment status. The applications provide real time map updates simultaneously to health officials in different geographic areas to assist in epidemic recognition and response.

EXAMPLE: The Oregon Health Sciences University hospital is developing a GIS application that provides disease vector analysis. Emergency room diagnoses are collected in a database where they are combined with similar diagnoses from other hospitals in the area. The address of each diagnosis can be plotted on a map containing street centerlines, hospitals and clinics, nursing homes, schools, etc. Plotting the locations of diagnoses on maps allows health officials to recognize patterns of disease that would not otherwise be apparent. Nursing homes and schools can then be notified quickly when signs of an epidemic are recognized.

EXAMPLE: The State of Indiana created a GIS application for analyzing incidence of lead poisoning in children. By redirecting screening efforts based on incidence maps, the state saved almost $2 million and secured an annual $240,000 grant to fund the state's lead poisoning prevention program.

Scenario 4 – Environmental Management

Situation

Once hailed as a model of environmental action in the area of river cleanup, the Willamette River has again fallen on hard times. The river has again become polluted to the point that public health warnings are no longer a rarity. A variety of pollution sources, types, and locations make it very hard to define an action plan that efficiently and effectively mitigates the problem, while keeping spending of scarce public funds to a minimum.

Current Approach

Data collection and analysis requires a great deal of cooperation and collaborative effort to combine or integrate activities and data across agencies that have different cultures, expectations, and missions. Scientists and staff from agencies responsible for monitoring collect data in the field about vegetation cover, extent of habitat, population of certain species, etc. The monitoring data from various sources must be combined to present a complete picture of the ecosystem damage and the potential effectiveness of the proposed action plan.

Staff spends a great deal of time contacting data providers to locate the best available data. Since this data often comes from many sources, the monitoring agencies must integrate the data with their own before they can use it. They usually get this data on CDs mailed to them. The base data often sought contains such themes as vegetation classes, roads, surface water, riparian areas, land use, soils, geology, and elevation data. When actions are integrated across multiple agencies using data that is outdated or developed at resolutions not intended for monitoring purposes, the results are suspect and may be challenged. This results in the need to defend mitigation decisions, a costly and time consuming process.

Utility Approach

Monitoring agencies all have access to the most current, authoritative base data from a single location via the Internet. The data is accessible interactively, meaning the scientists and their staffs do not necessarily have to download the data. However, the data can be downloaded via the web if an agency prefers to maintain a copy in their own environment.

The base data is developed with input from users to ensure that it meets their requirements for monitoring. The various layers of the base data are standardized and integrated by the data stewards prior to making them available. A single Internet location is available for users, providing tools for accessing the needed data, conducting query and analysis, integrating the base data with more detailed monitoring data, visualizing data interactions via maps and charts, and seeking assistance from other experts.

Monitoring can be done more easily, more effectively, and more often, using data that is more reliable and more accurate. This results in better decision-making that is more easily defended.

<u>EXAMPLE:</u> The effort to integrate 30 separate databases to enable analysis for the Spotted Owl Plan cost the federal government over $250,000. Critics were concerned with the validity of the data and the integration methods used. The databases for this effort were located in many distributed locations at multiple levels of government and were in many different formats. There was no simple means to tie them all together to form a coherent picture of the effect of all the various environmental programs on the health and distribution of the spotted owl in Northwest forests. In addition, because the data were not developed using the same underlying base data, analysis of the integrated data was extremely difficult and the results were suspect. As such, it was impossible to reach broad consensus as to appropriate actions based on the data and analyses. If a GIS Utility were in place, the locally collected data about spotted owls would have been easily integrated with state and federal data about biological conditions, saving tens of thousands of dollars in integration costs. In addition, the analytical results generated using the integrated databases would have generated far less controversy and few expensive lawsuits.

Supplement B – High Priority Data Development

Framework High Priority Data	Current Status	Timeframe for Completion*	Funding Needed
Geodetic Control	60% complete	Dec-06	$1,000,000
geodetic control points latitude/longitude & ellipsoid height			
Cadastral			$4,000,000
tax lot boundary, owner's name, mailing address	30% complete	Dec-06	
public ownership	50% complete	Dec-06	
Administrative Boundaries			$500,000
tax code boundaries	0% complete	Dec-06	
Urban Growth Boundaries	75% complete	Dec-05	
Zip code boundaries	90% complete	Dec-04	
Cultural Features			$1,000,000
site address	20% complete	Jun-06	
public buildings	5% complete	Dec-05	
critical facilities	10% complete	Jun-05	
Transportation		Dec-05	$1,500,000
bridges/culverts	20% complete		
road centerlines/classification	20% complete		
address ranges	15% complete		
route-mile posts	20% complete		
railroads	75% complete		
Digital Aerial Imagery			$4,000,000
one-meter images statewide	0% complete	Jun-06	
30-meter images statewide	0% complete	Jun-05	
one-foot images for cities	0% complete	Jun-06	
Elevation Data		Dec-04	$100,000
digital elevation models	90% complete		
Surface Water		Dec-05	$500,000
stream centerlines/classification	20% complete		
open water shorelines	20% complete		
flow paths & direction	20% complete		
Utilities		Dec-04	$100,000
transmission lines	50% complete		
Geoscience Features			$800,000
geology	15% complete	Dec-06	
soils	75% complete	Jun-06	
Bioscience Features			$1,000,000
anadromous fish habitat distributions	80% complete	Dec-04	
vegetation	20% complete	Dec-05	

wetlands	35% complete	Dec-05	
riparian areas	0% complete	Jun-06	
Landcover/Land Use			$1,000,000
landcover classification	5% complete	Dec-06	
land use classification	0% complete	Dec-06	
Hazards			$500,000
flood zone	5% complete	Dec-06	
wildfire fuel sources in interface boundary	0% complete	Dec-04	
wildland/urban interface boundary	0% complete	Dec-04	

High priority infrastructure data

$16,000,000

*Assumes funding for this business case is approved.

Supplement C – GIS Utility Data Needs

	Framework Data Needs												
Some Applications of Spatial Data in OR	Transp.	Boundaries	Cadastre	Imagery	Control	Elevation	Hydro.	Cultural	Geoscience	Bioscience	Utilities	Climate	Land Use
Involve Public in Developing Solutions to Environmental Problems	●	●	●	●	●	●	●	●	●	●		●	●
Develop Water Quality Management Plans for Streams		●	●	●	●	●	●	●	●	●			●
Maintain Water Bodies List for Clean Water Act Reporting		●		●	●		●			●			
Track Locations of Major Sewage Discharge Permits	●	●	●		●		●	●		●	●		●
Synchronize Wastewater Permits by Location	●	●	●		●	●	●	●		●	●		●
Perform Public Water Systems Assessment	●	●	●		●		●	●		●	●		●
Develop Geographic Response Plans for the Coast	●	●	●	●	●	●	●	●	●	●	●	●	●
Delineate Areas Exposed to High Levels of Toxic Air Emissions	●	●	●	●	●	●		●		●	●	●	
Internet Publishing of Toxic Chemical Locations	●	●			●		●	●		●			●
Monitor Increases in Toxic Releases		●	●		●	●	●	●	●	●	●	●	●
Support Efforts to Clean Up Contaminated Sites	●	●	●	●	●	●	●	●	●	●		●	●
Manage and Assign Resources Based on Need or Vulnerability	●	●	●	●	●	●	●	●	●	●	●	●	●
Perform Geologic Mapping				●	●	●	●		●				●
Perform Geologic Hazard Assessments	●	●	●	●	●	●	●	●	●	●	●	●	●
Regulate Energy Exploration, Production, and Reclamation	●	●	●	●	●	●	●	●	●	●	●		●
Manage State-Owned Land	●	●	●	●	●	●	●	●	●	●	●		●
Generate Revenue for Common School Fund	●	●	●		●			●					●
Land Acquisition, Disposal, and Leasing	●	●	●	●	●	●	●	●	●		●		●
Pest Management and Control		●	●	●	●					●		●	●
Agricultural Water Quality Assessment and Control		●	●		●		●		●	●			●
Pesticide and Herbicide Application Regulation	●	●	●		●	●	●		●	●		●	●
Property Appraisal and Assessment	●	●	●	●	●	●	●	●	●	●	●		●
Water, Wastewater, Stormwater Infrastructure Management	●	●	●		●	●	●	●	●		●		●
Economic Development	●	●	●	●	●	●	●	●	●	●	●	●	●
Public Safety and Emergency Response	●	●	●	●	●	●	●	●	●		●	●	
Community Planning	●	●	●	●	●	●	●	●	●	●	●	●	●
Code Enforcement	●	●	●		●	●	●	●	●	●	●		●
Environmental Management and Assessment	●	●	●	●	●	●	●	●	●	●	●	●	●
Facility Siting	●	●	●	●	●	●	●	●	●	●	●	●	●
Resource Allocation	●	●	●		●		●	●	●	●	●	●	●
Permit Tracking	●	●	●		●		●	●	●	●	●		●
Historic Preservation	●	●	●	●	●		●	●					
Park Siting and Management	●	●	●	●	●	●	●	●	●	●	●	●	●
Tracking Worker's Compensation Claims by Region		●			●			●					
Building Permit Management	●	●	●		●	●	●	●	●	●	●		●
Tracking Consumer and Business Trends	●	●			●			●			●		●
Coastal Land Management	●	●	●	●	●	●	●	●	●	●	●	●	●
Erosion Control	●	●	●	●	●	●	●	●	●	●		●	●
Prison Siting	●	●	●	●	●	●	●	●	●		●		●
Facility Management	●	●	●	●	●		●	●	●		●		
Transportation Planning	●	●	●	●	●	●	●	●	●	●	●	●	●
Coordinate Emergency Planning and Response	●	●	●	●	●	●	●	●	●		●	●	
Forest Management	●	●	●	●	●	●	●	●	●	●	●	●	●
Wildfire Planning, Response, and Control	●	●	●	●	●	●	●	●	●	●	●	●	●
Enhanced Emergency 911 Communication and Response	●	●		●	●	●	●	●	●		●		
Management of Water Availability for Ag and Public Consumption		●	●		●	●	●	●				●	●
Public Access to Water Rights and Availability Information	●	●	●		●		●	●					
Tracking Sensitive Drinking Water Sources	●	●		●	●	●	●	●		●		●	
Reporting on Rates of Emergency Services Use	●	●			●		●	●	●			●	●
Tracking Chemical Weapons Emergency Responses	●	●			●		●	●		●			
Tracking Radioactive Material Licenses	●	●	●		●		●	●		●	●		●
Tracking Birth and Death Statistics by Location	●	●			●			●					
Tracking Teen Pregnancy and Abortion	●	●			●			●					
Disease Surveillance Relative to Environmental Factors	●	●			●		●	●	●	●	●	●	
Allocation and Location of Client Resources	●	●	●	●	●		●	●			●	●	●
Child Welfare Management and Service Delivery	●	●			●		●	●					
Improve Match of Workforce Availability with Employer Demand	●	●			●		●	●					
Increase Knowledge of Business Location Choices and Trends	●	●	●	●	●	●	●	●	●	●	●	●	●
Provide Economic Devt Entities w/Data for Business Recruiting	●	●	●	●	●	●	●	●	●	●	●	●	●
Demonstrate Demographic Trends Impacting Oregon	●	●	●	●	●	●	●	●	●	●	●	●	●
Integrate Data Analysis & Policymaking Across Govt. Enterprise	●	●	●	●	●	●	●	●	●	●	●	●	●

Supplement D

Selected Examples of GIS Use in Other States

- **Maine** has used GIS to improve air quality. The GIS Unit of the Department of Environmental Protection is deploying a GIS application to visualize pollutant sources contributing to elevated ozone levels. The Gridded Emissions Inventory (GREMIN) provides a visual interface for calculating ambient levels of carbon monoxide, nitrogenous compounds, and volatile organic compounds and will be used to support air quality regulatory and improvement programs.
- The **Florida** Department of Transportation has implemented a GIS-based Transportation Decision Support System (TDSS) which supports the 5-year transportation plan preparation. Users can access road maps, design information, and ancillary information (photos and video logs) to test alternatives and quickly view information needed in the planning process. This approach has increased the quality of the planning process and road development work. It has supported grant applications for securing federal funding for road projects.
- **Minnesota** has installed Web-based kiosks accessing GIS databases, allowing travelers to get information on road and weather conditions, as well as tourism information. The program is the only one in the United States that provides an application combining real-time information, interactive live routing, and driving directions.
- The state of **New York** is using GIS to retain affluent retirement-age residents. In this case GIS technology merges map features with a centralized database of property, demography, and tax information to communicate to aging residents the tax benefits of not moving to out-of-state locations for retirement. The State's Department of Equalization and Assessment also uses GIS to evaluate property tax rates for local authorities statewide. In this way, the department maintains a stable tax base while ensuring consistency and equity in rates.
- GIS has been an important tool used by policymakers to establish sound and equitable guidelines for Growth Management statutes in **Vermont** and **Maryland**. GIS analysis helps state and local planners to make land use and development decisions.
- The **Delaware** Department of Labor (DOL) constructed a Web site that is breaking ground for the automation, integration, and access to social services information, employment opportunities and labor market information. People looking for employment now have a new tool at their disposal in the form of an interactive, GIS-based Web site called Career Directions, located at www.delawareworks.com or www.oolmi.net. The Web site includes information from the Department of Education, Delaware Health and Social Services, Delaware Economic Development Office, Department of Transportation, and The Family and Workplace Connection.
- The State of **Louisiana** uses GIS to help fight erosion as the state loses 25 to 35 square miles of coastland per year, which accounts for 80 percent of all coastal land loss in the United States. Louisiana's Natural Resources Department (DNR) deploys a very successful department-wide GIS and is deploying Web-enabled GIS applications to support coastal restoration programs.

- The North Carolina Clean Water Management Trust Fund assists Board members as they make decisions to disburse up to $48 million annually for land purchases and projects to improve water quality conditions statewide, spatial analyses, and otherwise model and plan for quality growth in North Carolina communities. The Center for Geographic Information and Analysis (CGIA), in collaboration with its partners statewide, is developing the next generation of surface water resource data and applications to support this program.
- The **Kentucky** Water Resources Development Commission used GIS technology and statewide GIS data to develop a strategic plan for the “2020 Water Plan.” GIS technology is being used on an on-going basis to evaluate water use and availability in the state.[1]

[1] South Carolina Strategic Plan for GIS, PlanGraphics, Inc., 2000

Supplement E

GIS Utility Funding Alternatives

In a study conducted for the Ohio Geographically Referenced Information Program, and partially funded by the National States Geographic Information Council, the funding sources and data management approaches of all 50 states to support comprehensive statewide GIS infrastructure development were examined. Fifteen states were found to have exemplary or unique programs and were studied in more detail. A wide variety and combination of funding sources are used to support statewide GIS infrastructure efforts in these states, primarily including:

- Dedicated funds
- Mission Driven Funding
- Assessments on Agencies
- Capital Funding
- Cost Recovery

Dedicated funding approaches included Wisconsin's property transfer fee dedicated for land information improvements. Vermont and Oregon are the only other states that have used this approach. Whereas, the Wisconsin transfer fee has generated over $70 million since 1991, the Oregon fee generates about $800,000 annually. Tennessee received a substantial State general fund commitment to pursue GIS infrastructure development. The Tennessee legislature approved $25 million over 5 years to develop statewide tax lot maps and data. They are in the first year of that development program. Maine, Arkansas, and Virginia have benefited from mission driven funding. Virginia is perhaps the most relevant comparison for this business case. The Virginia Base Map Program, under the leadership of the Virginia Geographic Information Network Board and the Governor's Secretary of Technology, recently received $10 million from the Wireless E-911 Services Board to develop several key components of the statewide GIS infrastructure, including digital aerial photography, statewide road centerlines, a statewide addressing database, and surface water data. They have just completed the second year of that effort and have recently finished the aerial photography, with the road centerline to be completed later this year. Arkansas has recently established a similar central funding mechanism as a trust fund, and was granted $1 million by the Economic Development Fund to assist in data development efforts.

Maine, Michigan, Kentucky, and North Carolina share the assessment approach with Oregon. Maine receives approximately $300,000 annually through assessments from 20 agencies. Michigan assesses only seven agencies, but receives $3 million annually, of which $1.1 million is committed to GIS infrastructure development. By comparison, Oregon assesses all 100+ agencies based on size and importance of geography to the agency's mission, and receives approximately $750,000 annually, of which $250,000 is committed to GIS infrastructure data development.

Massachusetts is well recognized for being the first state to finance IT projects, including some GIS infrastructure development efforts, with authorized capital funding in the form of long-term bonds starting in 1992. Since then, the State has issued more than $400 million in general obligation bonds to support several large IT and GIS projects. Kentucky has used capital funding each of the last two years to finance $1.5 million of GIS infrastructure development efforts. Capital funding is now being proposed for a Local Government Geographic Information Partnership Program, which would create partnership incentives for Kentucky local governments to share their high-resolution data with state agencies. The states that have used capital funding mechanisms have successfully used these funds to leverage significant federal funding assistance. However, most states have specific statutes that prohibit the use of capital funding to support IT development.

Cost recovery has traditionally been a part of the GIS funding mix for Minnesota, North Carolina, and Utah, including sales of map and data products, as well as contracted GIS services. However, revenues from these sources have diminished significantly in the last few years and all three states have pursued other funding options. Kansas has traditionally made most GIS infrastructure data available free of charge via the Internet, but has charged for 'premium value-added data products and services' for over a decade. The revenue from the premium products does not, however, fund any GIS infrastructure development. Oregon has some experience with cost recovery for contracted GIS services, but found that the demand was too low for a centralized service bureau approach and not enough revenue could be generated to pay for the provision of services, much less GIS infrastructure development.[1]

As GIS usage evolves, focus typically expands to include more data, technologies, applications, and participants. While some states initially focused on GIS, as its usage expands, attention seems to grow about data, including quality, accuracy, currency, and access issues. Recent technological improvements in GPS, satellite imagery, and other remote sensing techniques have also catalyzed expanded focus to include additional sources of data. While fewer offices, groups, directives or other documentation specifically address these technologies, some states do have specific reference to such technology, including in legislation. Institutionalized state approaches seem to increasingly incorporate a broad focus, as evidenced in adopted state plans, policies, standards, and other activities. Local and tribal governments, federal agencies, utilities, the private sector, and non-governmental organizations increasingly participate in state GIS groups and decision-making. This has important implications, since the needs and perspective of external organizations (local governments, tribes, regional agencies, etc.) are increasingly reflected in overall direction and funding, in addition to data policies, architectures, requirements, and custodianship.[2]

[1] Best Practices Report for the Ohio Spatial Data Cost/Benefit Analysis, Fries/Warnecke, Nov. 2001
[2] Statewide Leadership/Coordination of Geographic Information Technology in the 50 States, Warnecke, Sept. 2002