

ALASKA GEOSPATIAL STRATEGIC PLAN

Final, August 2011





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Contents

Executive Summary	5	5 Implementation Program	41
1 Introduction	8	5.1 Organizational and Management Initiatives	42
1.1 Overview	9	5.2 Policies, Standards, and Best Practices	43
1.2 Intentions of the Geospatial Planning	10	5.3 Communication and Outreach	44
1.3 Strategic Plan Unpacked	10	5.4 Statewide Framework Data	45
2 Alaska’s Current Geospatial Situation	12	5.5 Unified Data Clearinghouse	46
2.1 Stakeholder Community	13	5.6 Sustainable Funding	47
2.2 Alaska’s Existing Geospatial Framework	15	Appendix A: Strategic Planning Methodology	48
2.3 Collaborative Geospatial Efforts	21	Online Survey	49
2.4 Evaluation of Alaska’s Geospatial Situation	22	Regional Stakeholder Workshops	51
3 Strategic Foundation	28	Executive Management Interviews	54
3.1 Strategic Goals	29	Plan Authoring	54
4 Requirements	37		
4.1 Organizational Needs	37		
4.2 Policies, Standards, and Best Practices	38		
4.3 Communication and Outreach	39		
4.4 Statewide Framework Data	40		
4.5 Unified Clearinghouse	40		





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Executive Summary

The state of Alaska was recently awarded a Federal Geographic Data Committee (FGDC) Cooperative Agreement Program (CAP) grant to develop Geospatial Strategic and Business Plans in support of the Fifty States Initiative.

As a key step in implementing the National Spatial Data Infrastructure (NSDI), these plans facilitate the coordination of programs, policies, technologies, and resources that support the collection and sharing of geospatial data across the state.

This Strategic Plan is the first step in the process of establishing a direction for a long-term statewide geospatial effort that builds upon the previous successes of the Statewide Digital Mapping Initiative (SDMI) and the Alaska Geographic Data Committee (AGDC), while working towards expanded formalized communication and collaboration for all Alaskans. This planning was driven by the goal of engaging stakeholders throughout the state in an open and transparent manner, offering an online survey and workshops to ensure stakeholders' needs and ideas were reflected as the foundation for the resulting plans.

Alaska has a long history of using geospatial technology and collaborating, in an informal and ad hoc basis, to effectively achieve geospatial initiatives. Private and public entities both small and large have adopted the technology

to support their unique missions and have established partnerships to develop and share geospatial information. Although there are many rich examples of these successes, there are also many opportunities to increase collaboration to help realize additional value from investments made in the technology. This collaboration can help increase the quality and use of technology, reduce redundant activities, and save on capital expenditures.

The following vision and mission statements provide overall direction for helping to increase this collaboration and the resulting benefits.

Vision

- *Alaska will create a sustainable statewide geospatial framework to provide technology, policies, standards, and human resources necessary to help improve the sustainability, quality, and availability of geospatial information to all Alaskans.*

Mission

- *Create a spatial infrastructure that will be supported by a participatory environment to facilitate collaboration and communication between all public and private stakeholders based on a philosophy of shared responsibilities, shared costs, shared benefits, and shared control.*

This direction will be supported by four (4) core strategic goals:

Strategic Goal 1: Establish a sustainable participatory governance structure to effectively and efficiently coordinate and communicate geospatial efforts – Under the leadership of a State Geospatial Information Officer (GIO), a representative body, referred to as the Alaska Geospatial Council, will be empowered to coordinate and communicate geospatial efforts. This Council will be guided by a subsequent companion Business Plan and supported by technical working groups. This effort incorporates the intergovernmental representation of SDMI and AGDC and will build upon previous successes, while expanding coordination, cooperation, and representation.

Strategic Goal 2: Ensure statewide spatial data and technology are available to as many potential users as possible and are developed, managed, procured, and coordinated according to best practices - Efforts should be made to develop and manage geospatial data in a coordinated manner by establishing standards, adopting or developing best practices, forming mechanisms for supporting collaborative data initiatives, providing a unified data clearinghouse, and facilitating the completion of statewide framework data.

Strategic Goal 3: Expand and improve the use and awareness geospatial technologies through increased collaborative educational opportunities and outreach –

The Alaska Geospatial Council will help coordinate the professional development of staff, increase management and executive decision-maker's awareness of the benefits of the technology, and continually evaluate new technology and best practices suitable for Alaska.

Strategic Goal 4: Identify and secure sustainable funding sources used to support ongoing statewide geospatial programs –

Partnerships and business cases will be formally established to determine the most suitable geospatial solutions for the state and help coordinate and solicit funding for these solutions.

The achievement of these goals will require significant organizational and institutional changes that need to be led and adopted by Alaska's geospatial community. A subsequent companion Business Plan will support the implementation of the Strategic Plan, which will detail the benefits resulting from a collaborative statewide approach to geospatial initiatives and recommends an implementation plan to achieve long-term efficiency and stability.

In summation, this effort builds and expands upon previous geospatial successes within the state. This effort is the next

logical step in Alaska's geospatial progression, which needs to be clearly sanctioned by executive action or order to assign responsibility and authority to achieve the geospatial objectives in an unbiased manner.

This strategic plan is developed based upon substantial input from the stakeholders. This effort will result in greater cooperation, collaboration and communication among all stakeholders, leading to greater productivity, less redundancy, and more informed policy across all disciplines and business lines.

Following the development of the Strategic Plan is a forthcoming companion Geospatial Business Plan that addresses the incremental implementation of the strategic framework in this Plan. The Business Plan will prioritize the activities of this implementation, while setting out an ambitious cooperative agenda to move Alaska's geospatial plan forward.





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1 Introduction

1.1 Overview

Alaska is a vast and diverse state with an abundance of natural resources, wildlife habitats, and unique human interests. Geographic information is essential to the understanding and proper management of these resources. Stakeholders throughout Alaska in the private and public sector have a long history of embracing geospatial technology to support these functions.

Alaskan stakeholders have also demonstrated significant advances in acquiring elevation and imagery data for the state through intergovernmental collaboration and cooperation. Currently approximately 20% of the state has been mapped with each of these datasets through intergovernmental collaboration and cost sharing.

The application of geospatial technology often requires significant investment from stakeholder agencies. Expanded coordination can help realize better value from these investments through opportunities for information sharing, partnerships to pool resources, communication of best practices, and organizing to implement activities in a harmonized manner. These efforts can help increase the quality and use of technology, reduce inefficient redundant activities, and guide more cost effective and justifiable capital expenditures.

What is the Fifty States Initiative?

The Fifty States Initiative is partnership between the National States Geographic Information Council (NSGIC) and the Federal Geographic Data Committee (FGDC) designed to bring all public and private stakeholders together in statewide GIS coordination bodies that help to form effective partnerships and lasting relationships.

The initiative is managed by the FGDC which issues Cooperative Agreement Program (CAP) "grants" each year enable the states to improve their coordination mechanisms and support development of business plans.

There is a critical need to coordinate GIS [Geographic Information Systems] activities on a statewide basis to eliminate waste and improve efficiency in government. Agencies at all levels of government need to coordinate with other stakeholders to keep from duplicating the development of geographic data and systems at taxpayers' expense. Those stakeholders include non-profit organizations, academia, business and utilities.

Source: http://www.nsgic.org/hottopics/fifty_states.cfm

The state of Alaska was awarded a Category Three (3) Federal Geographic Data Committee (FGDC) Cooperative Agreement Program (CAP) grant to be used for "*Strategic and Business Plan Development in Support of the NSDI Future Directions Fifty States Initiative.*" This grant supported the development of this Strategic Plan. This

Plan and the resulting collaborative framework will help ensure Alaska's development and governance of geospatial initiatives supports the National Spatial Data Infrastructure (NSDI). The Plan also aligns state geospatial efforts with national efforts to achieve a universally accepted geospatial platform built upon best practices and a common operating picture.

1.2 Intentions of the Geospatial Planning

This Strategic Plan offers a long-term path for establishing and maintaining a collaborative geospatial framework that meets the needs of Alaskans. The vision, mission, and goals included in this Plan build a common understanding of where the collective geospatial community needs to go and guidance for moving in this direction. A Business Plan will follow to further define the initiatives that need to be accomplished to meet the strategic goals, along with a business case detailing the investment required and projected benefits to be realized. Together, these plans offer a mechanism for obtaining the participation and support needed to develop the statewide collaborative framework.

A fully transparent and participatory process was used to understand the needs of the entire community and to ensure that plans moving forward incorporate these ideas to meet common needs. An online survey was conducted to gather input from representatives of geospatial stakeholder groups within Alaska. This was followed by six

(6) stakeholder workshops held across Alaska to foster an open dialogue about the status of geospatial coordination in Alaska and what can be done to improve the benefits of the technology. Interviews were also held with executive management from federal, state, and local government, as well as universities, tribal, and nonprofit organizations. In total, 24 stakeholders participated in 17 drill down interviews. Information from each of the above noted activities was used to guide the direction of this planning effort. For more information on this process, see *Appendix A: Strategic Planning Methodology*.

This Plan is written especially for government executives, management from the private and public sector, and all geospatial practitioners within the state.

1.3 Strategic Plan Unpacked

The remainder of this Strategic Plan is organized as follows:

- **Section 2: Alaska's Current Geospatial Situation** – An overview of the state of geospatial technology within the state, including how stakeholders are currently applying the technology, a history of collaborative efforts, the status of core geospatial data, and an evaluation of the success of geospatial initiatives.
- **Section 3: Strategic Foundation** – Includes a vision, mission, and goals to help direct the

establishment of a statewide coordinated geospatial framework.

- **Section 4: Requirements** – Requirements to be considered when working to achieve the strategic goals, including: organizational needs; policies, standards, best practices; communication and outreach; statewide framework data; and a unified clearinghouse.

- **Section 5: Implementation Program** – Overview of the implementation steps that will need to be taken to achieve the strategic goals.





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2 Alaska's Current Geospatial Situation

2.1 Stakeholder Community

Geospatial technology is being used by stakeholders across Alaska. The community of geospatial stakeholders includes practitioners, decision-makers, management, and educators from government, nonprofit, academic, and commercial organizations.

Geospatial usage is driven heavily by management of land within Alaska. Alaska is unique in the significant amount of land owned by federal and state government.

Land Ownership in Alaska by Organization			
	Million acres	Km ²	% of total
State of Alaska	89.8	363,408	24.1
BLM	82.5	333,866	22.1
USF&WS	78.8	318,892	21.1
NPS	52.4	212,055	14.1
Alaska Native Corporations	39.3	159,041	10.5
USFS	22.4	90,650	6.0
Other private	5.9	23,876	1.6
DoD	1.7	6,880	0.5
TOTALS	372.8	1,508,668	100.0

Table 1 - Land Ownership in Alaska by Organization

The stakeholders of geospatial technology include:

State Government - State government agencies that have widely embraced technology in support of specific initiatives. Those identified as part of this effort include:

- Alaska Energy Authority (AEA)
- Alaska Department of Natural Resources (DNR)
- Alaska Department of Fish & Game (ADFG)
- Alaska Department of Transportation & Public Facilities (DOT&PF)
- Alaska Department of Environmental Conservation (DEC)
- Alaska Department of Commerce, Community, and Economic Development (DCCED)
- Alaska Department of Public Safety (DPS)
- Alaska Department of Military and Veterans Affairs (DMVA)
- Alaska Department of Health and Social Services (HSS)

Geographic Information System (GIS) technology is used heavily to inventory and manage natural and cultural resources within the state and on state lands.

DOT&PF, DNR, DMVA, ADFG, DEC, and DCCED have all been engaged in the Statewide Digital Mapping Initiative (SDMI, discussed in section 2.3). In addition, DNR hosts the



Alaska State Geospatial Data Clearinghouse (ASGDC). However, there is no centralized entity for coordinating geospatial efforts across all state agencies.

Federal Government – The federal government is very active in Alaska’s geospatial community. The agencies that participated in this planning process include:

- Bureau of Land Management (BLM)
- National Oceanic and Atmospheric Administration (NOAA)
- U.S. Geological Survey (USGS)
- U.S. Forest Service (USFS)
- U.S. Fish and Wildlife Service (USF&WS)
- DoD (Army, Navy, Air Force)
- U.S. Coast Guard
- U.S. Environmental Protection Agency (EPA)
- U.S. Census Bureau
- National Resources Conservation Service (NRCS)
- Federal Aviation Administration (FAA)
- National Geospatial-Intelligence Agency (NGA)
- US Arctic Research Commission (USARC)
- National Park Service (NPS)

The federal government has several unique interests in Alaska that drive geospatial technology use:

- NOAA is leading the GRAV-D initiative to update the inadequate geodetic model within Alaska.

- BLM, DoD, USFS, USF&WS, and NPS each own significant land holdings in Alaska and use GIS to manage this land.

Local Government – Larger municipalities have fully adopted geospatial technology into their enterprise and use it to support land use, zoning, emergency management, public works, public safety, and asset management, among other applications. These organizations are generally technology and data rich. Small remote rural areas, including those with tribal representation, have inconsistent GIS capabilities and rely heavily on state organizations to meet their GIS needs.

Academic Community - The academic community has been heavily involved in the education of geospatial professionals, research and development, offering technical services, and quality reviews of proposals and data products. The University of Alaska has been involved in the SDMI, providing technical assistance for the establishment of requirements for collection of statewide basemap data. The University of Alaska Fairbanks has implemented the Geographic Information Network of Alaska (GINA). The University system provides instruction in the disciplines of field and photogrammetric surveying, remote sensing, geodesy, cartography, and GIS. Other academic research institutes, such as the Prince William Sound Science Center and the Institute of the North, are using geospatial information to aid in research.

Commercial Sector – Oil/ gas companies, mining companies, native corporations, forest products companies, and many others use GIS for management of assets, design and engineering of new infrastructure, and for exploration of resource opportunities. In addition, the commercial sector also provides geospatial services including data development, surveying, software vending, training, and system/ application development.

Non-Profit Organizations – Non-Profit organizations are also involved within the geospatial community. These organizations are using the technology in areas of research, environmental management, and social wellbeing activities. Some of these organizations include the Copper River Watershed Project, Kenai Watershed Forum, Nature Conservancy, and the Tanana Chiefs Conference.

Utilities – Regional electric and water/wastewater utility associations are using GIS to manage their utility assets.

2.2 Alaska's Existing Geospatial Framework and Data

2.2.1 Status of Statewide Geospatial Coordination

Statewide coordination of geospatial efforts will only be successful if its geospatial framework is established specifically with Alaska's unique needs and situation in mind. The National States Geographic Information Council (NSGIC) has defined nine (9) criteria that it believes are critical for effective statewide coordination of geospatial initiatives. These criteria are considered best practices that many states have adopted and can be useful within Alaska. The table on the following page lists these criteria, along with an assessment of Alaska's progress in implementing the criteria.



Status of Alaska's Statewide GIS Program		
NSGIC Characteristic	Alaska Status	Description
A full time paid coordinator with authority to implement the state's strategic and business plans	Not implemented	No single coordinator exists for statewide geospatial efforts. The state does not have any formal leadership of geospatial activities to support the implementation of this Strategic Plan and a forthcoming companion Business Plan.
A clearly defined authority exists for statewide coordination of geospatial technologies and data production	Not implemented	No formal authority exists to coordinate statewide geospatial efforts in Alaska. Although the Statewide Digital Mapping Initiative (SDMI) has coordinated efforts for statewide data collection, this body does not have formal authority to prioritize, execute, and manage statewide geospatial initiatives other than the digital basemap initiative.
A statewide coordination office has a formal relationship with the state's CIO (or similar office)	Not implemented	Alaska does not have a statewide coordination office or a Chief Information Officer. The state does have an Enterprise Technology Services (ETS) department, but this department does not have governance responsibilities for all of the state's technology initiatives. No formal relationship exists between the ETS department and statewide geospatial efforts (including SDMI).
A champion (political or executive decision maker) is aware and involved in the process of coordination	Not implemented	Several members of the executive, legislative, and administrative branches of state government are aware of the coordination planning that has been initiated, but no champion has been identified to continually support the coordination effort.
Responsibilities for developing the NSDI and a state clearinghouse are assigned	Partially Implemented	The SDMI has taken responsibility for developing orthoimagery and elevation data, but not the remaining NSDI data and associated data clearinghouse.
The ability to work and coordinate with local governments, academia, and the private sector	Not Implemented	There are many examples of successful coordination between private and public sector organizations, but there are no formal mechanisms (including contract vehicles, standard operating procedures, etc.) within state government that can be continually utilized to support these collaboration efforts.
Sustainable funding sources exist to meet projected needs	Not implemented	No sustainable funding sources exist specifically for statewide geospatial needs. Funding is generally allocated for single initiatives or as part of related programs.
Coordinators have the authority to enter into contracts and become capable of receiving and expending funds	Implemented	Government agencies have the authority to contract with other organizations and can transfer funds. This authority and the resulting contracts are generally executed on an agency and/or project specific basis.
The Federal government works through the statewide coordinating entity	Not Implemented	No statewide coordinating entity exists. Although the federal government has supported statewide and regional efforts, and has partnered with individual agencies, this coordination is not universal.

Table 2 - Status of Alaska's Statewide GIS Program

2.2.2 NSDI Framework Data Status

Data are essential to the application of geospatial technology. Significant investments are often required to obtain and support these data over time. Coordinated statewide efforts can assist in the development, management and dissemination of these datasets to meet the needs of the largest possible number of users, while pooling resources and reducing redundant efforts to produce the data in the most cost-effective manner.

As part of the NSDI, seven (7) framework datasets are considered critical for applying geospatial technology and commonly required by most uses and users of the technology. These seven datasets are: geodetic control, orthoimagery, elevation, transportation, hydrography, cadastral, and governmental units. Participants in this planning process consistently expressed needs for each of these datasets and agreed that these are the most critical for the broad base of users in Alaska. The status of each of these datasets was reviewed to aid in determining how a coordinated effort might support these in the future and how these efforts might roll up into the NSDI. It is unreasonable to expect these datasets can be acquired in a single effort; therefore, an incremental approach that leverages and maximizes intergovernmental collaboration over time must be stressed.

Alaska’s status in the development of each of the NSDI framework datasets is provided below.

Geodetic Control - Geodetic control exists for the state, but is often not of the density and accuracy required for statewide mapping needs. These control points are not of a density to produce required elevation and imagery basemaps. Elevation heights in these data may be in error by up to 2 meters because of errors in the geoid model.

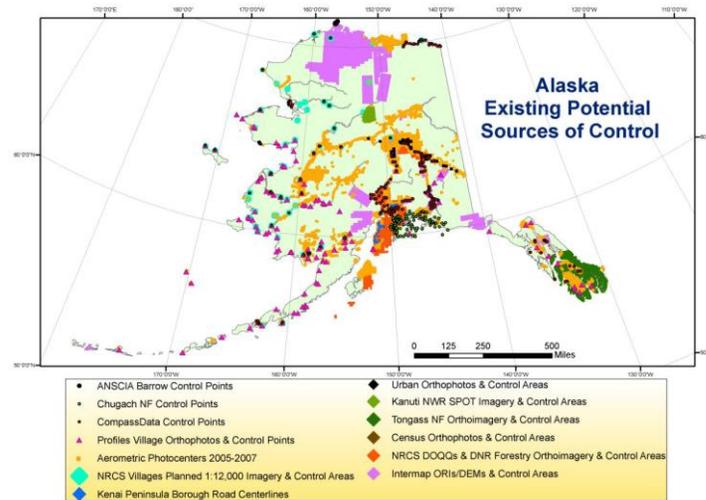


Figure 1 - Existing Geodetic Control in Alaska. Source: http://www.alaskamapped.org/assets/2009/6/12/SDMI_Task4_Control_Report_v2.4.1_1.pdf

Geodetic control is continually being collected for various localized projects at various density levels. NOAA’s efforts with the GRAV-D project will update the geoid model used for geodetic control, helping to improve accuracy requirements. In fact, NOAA has prioritized GRAVD-D in Alaska due to the porous nature of available control. In

addition, the SDMI recognizes the need for updated statewide geodetic control and is developing plans to update this dataset in a cost-effective manner that integrates data collected from different and disparate initiatives.

Orthoimagery - Alaska does not have current vintage statewide orthoimagery meeting the needs of users in the state. The most recent statewide orthoimagery was collected by the Alaska High Altitude Aerial Photography Program. These data are at least 25 years old and for the most part are not orthorectified.

SDMI efforts have been ongoing since 2009 to collect orthoimagery for the state with 12.2-meter root-mean-square error (RMSE), or 1:24,000 accuracy, with 2.5-meter spatial resolution. To date, orthoimagery has been purchased for the entire state, with approximately 39% of this collected and 24% of the images orthorectified to the best available digital elevation model (DEM). Samples of this collected data have indicated accuracy requirements that exceed requirements, with 2.5-5 meter RMSE and accuracy of 1-2 pixels. In cases where the National Elevation Dataset (NED) was used for orthorectification, digital masks were created to allow reprocessing of the data to updated elevation models at a later date. Plans are in place to complete the entire state by 2014.

These statewide datasets are supplemented by aerial imagery that has been collected for project-specific

regions, including the 2010 USACE Kenai River Aerial Photography, 2008 Kodiak Island Housing Authority Profile Mapping, the 2007 Coastal Villages Regional Fund Profile Mapping, and the 2006 USDA Tongass National Forest DOQQ.

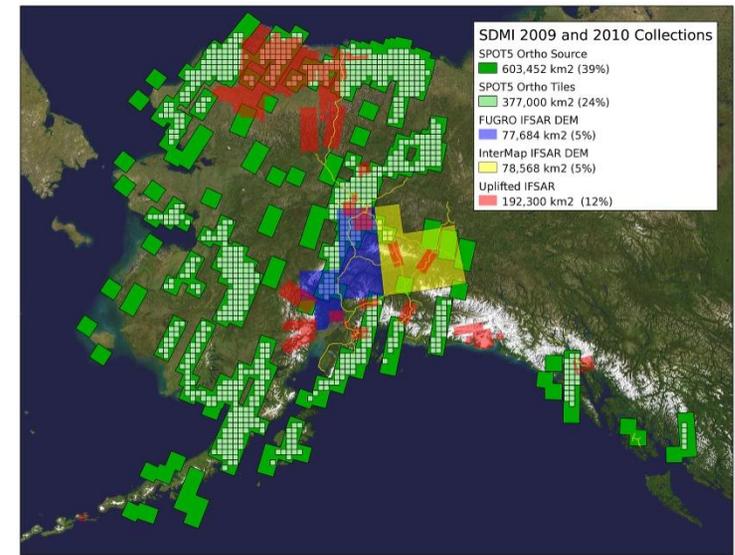


Figure 2 - Status of the SDMI Statewide Orthoimagery and DEM Data Collection, February 2011. Source: http://www.alaskamapped.org/asmc/2011/SDMI_GINA-Heinrichs-SDMI_ortho_and_dem_status.ppt

Elevation - Existing statewide elevation data is available with many significant inaccuracies and inconsistencies. The National Elevation Dataset (NED) produced by USGS as part of the National Map is substantially lower in resolution than the NED that exists for the lower 48 states and does

not meet National Map Accuracy Standards or the needs of most users. The Advanced Spaceborne Thermal Emission and Reflection Radiometer Global Digital Elevation Model (ASTER GDEM) is also available, but has many data inconsistencies and inaccuracies. The NED and ASTER GDEM are widely considered inaccurate and incapable of meeting modern applications across all disciplines.

SDMI efforts have been ongoing since 2010 to collect updated IFSAR (Interferometric Synthetic Aperture Radar) elevation data for the state with 2-meter root-mean-square error (RMSE), or 20-foot contour accuracy, and 5-meter post spacing. To date, approximately 20% of Alaska has been collected as part of the SDMI effort, with plans to complete the remainder of the state incrementally in the future, pending funding. Additional data have also been provided for 12% of the state (10% of these data do not overlap data collected in 2010), with lower accuracy than that collected as part of SDMI.

These statewide datasets are supplemented by elevation data that have been collected for project-specific regions (e.g., Anchorage Municipality LiDAR, Kenai Peninsula LiDAR, and US Forest Service Southeast SPOT HRS DEM, among others). These datasets vary in quality and accuracy, but are generally collected using higher accuracy LiDAR.

Transportation (Street Centerlines) - Transportation data exist from a variety of sources across the state. The Alaska DOT&PF maintains an addressed, routable, and linear

referenced street centerline dataset collected from GPS for all state-maintained highways, which DOT&PF stores in a mainframe system. In addition, many local governments maintain street centerline data for local roads. The US Forest Service and DNR also have centerline data for roads within state and federal forest lands. There is no single, integrated dataset that is continually maintained for all roads as they are modified.

Hydrography - Most geospatial professionals appear to be using the USGS National Hydrography Dataset (NHD). This dataset does not meet national map accuracy standards for the entire state, as most of the information has been collected from 1:63,360 scale USGS topographic maps.

USGS, USFS, the University of Alaska, and the Nature Conservancy are collaborating to continually update NHD. DNR also has an intern program in collaboration with UAA for updating the NHD with surveyed meanders on State lands. Workflows have been developed to process higher accuracy data collected from individual projects and incorporate these datasets into the NHD dataset.

Updated hydrography data is being collected for part of the state as a derivative of the statewide elevation data collection. This data should continue to be collected as this effort moves to the remainder of the state. No efforts have been made at this point to integrate the information with NHD.



Cadastral - Land records are maintained by the various landholders within Alaska, including federal and state governments and tribal organizations. Local governments also maintain cadastral information for property ownership within their jurisdictions. The Alaska Cadastral Initiative, supported by the Alaska DNR and the BLM, is working to create an accurate statewide land parcel dataset that is maintained over time. This effort has partially integrated data from various state, federal, and local government sources. Additional efforts are underway to complete this dataset and develop procedures for updating the dataset over time.

Administrative Boundaries - Most geospatial professionals are using the Census TIGER data for administrative boundaries. Other political and administrative boundaries are available from state and local governments for election districts, municipal/ borough boundaries, and other miscellaneous administrative boundaries.

2.3 Collaborative Geospatial Efforts

Many stakeholders within Alaska have realized the value in collaborating to achieve geospatial initiatives. Formal partnerships have been established at the state, regional, and local level to develop commonly needed datasets and provide mechanisms and tools for sharing information. As a result, these efforts have shown proven success in pooling resources to save money, reducing efforts in accessing data, and improving awareness of existing technology capabilities and benefits.

Most of these efforts have been established for single projects to meet a one-time need or specific focus. Partnerships for localized projects have been focused on data development needs and do not continue in perpetuity to maintain this information over time. Statewide, the efforts have focused on information communication and collaboration to increase awareness and provide networking opportunities, as well as statewide data collection and sharing.

Some of the major collaborative efforts that were recognized include:

Statewide Digital Mapping Initiative (SDMI) – The SDMI was established as a collaborative statewide program to collect basemap (orthoimagery & elevation data) information across the state. This program is formally composed of several state government agencies and is supported by federal and state government cost sharing

partners. The program has focused on the collection of orthoimagery and digital elevation models (DEM) for the state, including defining requirements, procuring contractor services, managing the quality of deliverables, and storing/hosting the data through the Alaska Mapped web mapping portal. Elevation data have been partially collected and plans exist to collect additional data in the future. Orthoimagery has been purchased for the entire state, with collection and orthorectification partially complete.

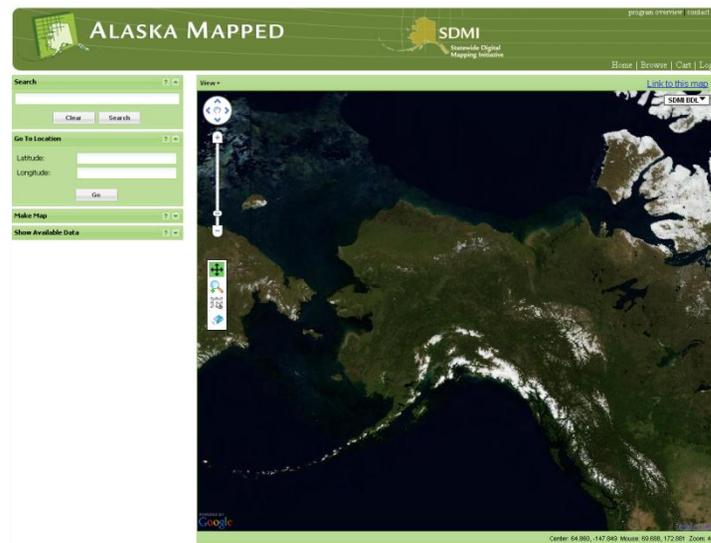


Figure 3 - The Alaska Mapped website acts as the authoritative statewide public source for orthoimagery and elevation data.

Alaska Geographic Data Committee (AGDC) – The AGDC was founded to support the goals of the FGDC in Alaska

and is supported in part by the USGS. The Committee has focused on improving coordination and communication of geospatial efforts within the state and is composed of volunteers from private and public organizations. Public forums, newsletters, and websites were used for coordination and communication.

Kenai Peninsula LiDAR – LiDAR (Light Detection And Ranging) data were collected under the direction of the Kenai Watershed Forum. These data were collected over a 4-5 year period for about half of the Kenai Peninsula. The project was supported by several partners, including federal, state, and local government agencies. Informal networking was used to determine interest, followed by formal agreements between partners (Memorandums of Understanding), requirements workshops, and data collection. USGS helped with contract management and to define technical specifications and the University of Alaska Fairbanks provided quality control services.

Southeast Alaska GIS Library - The Southeast Alaska GIS Library is a regional node for sharing and disseminating geospatial data, specifically datasets that are focused on southeast Alaska. Data are provided to the Library from various sources and is hosted to the public through online websites and services. An interagency steering committee includes various government and university organizations to provide strategic direction, manage legal concerns, and allocate funding for the Library.



Figure 4 - The Southeast Alaska GIS Library serves geospatial information from many sources for the region through a centralized web portal.

Fairbanks Regional Aerial Imagery - Aerial imagery around the Fairbanks region was collected as a coordinated effort led by the Alaska Division of Forestry, with partners from the Fairbanks North Star Borough, Tanana Chiefs Conference, the Alaska Fire Service, and the Bureau of Land Management. Imagery was collected in 2002, 2003, and 2004 from Quickbird and Spot. Most funding came from a federal grant, with additional support from partnering agencies.

In summation, this is a partial list of many valuable collaborative geospatial efforts and while some initiatives may intersect, many do not, leaving room for optimization of these efforts across the state.

2.4 Evaluation of Alaska’s Geospatial Situation

An evaluation was made of the Strengths, Weaknesses, Opportunities, and Threats (referred to as “SWOT” analysis) for Alaska’s geospatial situation. This analysis focuses internally on factors that are working well, or strengths, as well as things that may need improvement, or weaknesses. External factors that could positively influence (opportunities) or negatively influence (threats) the geospatial community were also reviewed. This evaluation was driven heavily by information received from survey and workshop participants during the planning process. The table to the right highlights the key findings of this analysis.

Table 3 - Overview of SWOT Analysis

2.4.1 Strengths

Recognized strengths of the geospatial community include:

Publicly Available Geospatial Data - Data are made available to the public freely from websites hosted by governmental and university agencies. The two most widely mentioned statewide data repositories were the Alaska State Geospatial Data Clearinghouse (ASGDC) hosted by the Alaska DNR and the Alaska Mapped website hosted by the University of Alaska Fairbanks (UAF). The former generally provides vector data for DNR and some data from other state agencies, while the latter focuses on providing orthoimagery and elevation raster datasets. Other websites are provided by federal, state, and local governments and regional consortiums (e.g., Anchorage Municipality, Kenai Peninsula Borough, Fish & Game, Alaska Ocean Observing System, and Southeast Alaska GIS Library). These websites provide data through various means, including through FTP, web services, and mapping interfaces.

Individuals expressed satisfaction with the SDMI efforts being performed to collect orthoimagery and elevation data, since these efforts have produced vital data not previously available.

	Positive	Negative
Internal	Strengths <ul style="list-style-type: none"> Publicly Available Geospatial Data An Active and Engaged Geospatial Community Academic Advancement of Geospatial Technology Extensive Experience with Collaborative Geospatial Initiatives 	Weaknesses <ul style="list-style-type: none"> Geospatial Data Do Not Meet Requirements Lack of Awareness and Accessibility of Geospatial Data Lack of Statewide Coordination Size and Complexity of Alaska
	Opportunities <ul style="list-style-type: none"> Budget Constraints Emergency Management Climate Change Economic Development Natural Resource Management Demand for Government Transparency 	Threats <ul style="list-style-type: none"> Limited Funding/ Resources for Geospatial Initiatives Lack of Awareness of Geospatial Technologies Pace of Changing Technology
External		





Figure 5 - The Alaska State Geospatial Data Clearinghouse provides access to various state and local datasets.

An Active and Engaged Geospatial Community – The Alaska geospatial community is active and is supported with many opportunities for networking and communication:

- Regional geospatial user groups (including the Kenai Peninsula GIS User Group, Kodiak Island GIS User Group, Juneau Spatial Data Discussion Group, and Northern Alaska Spatial Data User Group) act as regional consortiums that have active

participation and are good for informal communication and collaboration. In some cases (e.g., the Kodiak Island GIS User Group), these user groups have acted as a catalyst for collaborative geospatial efforts, since they provide an informal way for individuals from different agencies to network and understand commonalities.

- The annual Alaska Surveying and Mapping Conference is a resource that serves to foster communication and collaboration and allows for the building of informal relationships through networking.
- The Alaska Geographic Data Committee (AGDC) has supported a strong communications network with inclusive collaboration. It has provided a single voice for the stakeholders and at some points had broadly assigned active working groups with open involvement from the community.
- Alaska also has strong presence and involvement of national geospatial professional organizations, including ASPRS (American Society of Photogrammetry and Remote Sensing), Urban & Regional Information Systems Association (URISA), the American Congress on Surveying & Mapping (ACSM), and Alaska Society of Professional Land Surveyors (ASPLS).

Academic Advancement of Geospatial Technology – The University of Alaska system has advanced the geospatial

community by providing educational opportunities, investing in research and development, and providing technical support to geospatial initiatives. The University system provides instruction in disciplines that support geospatial efforts (i.e., field and photogrammetric surveying, remote sensing, geodesy, cartography, and GIS). The University of Alaska has multiple geospatial libraries/warehouses, data distribution/processing mechanisms and multiple remote sensing operations including satellite and Unmanned Aerial Systems (UAS).

Extensive Experience with Collaborative Geospatial Initiatives – As reviewed in section 2.3, there are many success stories of statewide and regional collaboration to collect geospatial data. Individuals with data needs have worked informally with other agencies to understand common needs and determine ways that the entities can collaborate. These are often followed with formal requirements workshops that engage more stakeholders. Funding is pooled to help share the costs of these initiatives and technical responsibility has been given to various parties.

2.4.2 Weaknesses

Recognized weaknesses of the geospatial community include:

Geospatial Data Do Not Meet Requirements - Although significant amounts of data are available, many users noted the data is not of the quality/accuracy, vintage, or

completeness required. These data include elevation, orthoimagery, geodetic control, and hydrography. In addition, several other key statewide datasets have not been collected, including street centerlines and cadastral data. The large geographic size of Alaska means data acquisition is costly, and since dedicated or sustainable funding has never been available, the resulting data often do not meet the needs of users or the accuracy standards of the USGS. These datasets include, but are not limited to, those framework data that are discussed in section 2.2.1.

Lack of Awareness and Accessibility of Geospatial Data - Data are often being made accessible to the public for use, but many felt that efforts should be made to increase awareness of data offerings and improve access to data.

- There is no formal responsibility for communicating what data are available, who is responsible for the data, and where to access this data. This results in difficulty finding data and data not being used to the extent that it could be if more individuals were able to access it. In addition, there is no single access point for geospatial data within the state, resulting in confusion over where to look for data online, an additional burden for finding data, and conflicts in determining the authoritative owner of datasets.
- Data sensitivity is often encountered, with data creators lacking trust in how the data may be used



by others. Sometimes the lack of willingness to share data is mandated by interests of homeland security or national defense. (Examples: Information on Coast Guard Base and pipeline locations)

- The licensing of data by specific agencies or for specific uses prohibits free sharing of the data with other users, resulting in the data not being used to its full capacity.
- Privately financed data collected on public lands is often not made available to the public.

Lack of Statewide Coordination –Areas for improvement in coordinated statewide efforts include:

- While SDMI has been successful in reaching out to stakeholders across the state to understand needs and communicate status of actions, the executive committee consists entirely of individuals from state government, leaving room for more participation from other stakeholders when making critical decisions.
- The SDMI has focused on meeting basemap data requirements, leaving room for improvement in collaboration on other geospatial needs, including training, technology / management best practices, and software/ applications.
- Although the AGDC has been beneficial for coordination, stakeholders felt it lacks a specific

mandate or authorization, funding, and strong leadership each of which affect its ability to make binding determinations on needed geospatial initiatives and affect funding for those initiatives.

Size and Complexity of Alaska – The size of Alaska and the complexities of its geographies present challenges when doing work in the state. This translates to higher costs for statewide data collections. Access to some remote parts of the state where there are no roads can be difficult. Travel between locations can be expensive, complicating coordination efforts and increasing costs of efforts.

2.4.3 Opportunities

Budget Constraints – In today’s economic climate, with budget cuts and the focus on cost savings affecting government operations, there is an opportunity to use geospatial technology more efficiently and apply the technology to perform processes more quickly and cost effectively. Proving the benefits of the technology could help increase the support of its use in government.

Emergency Management – In light of recent natural and manmade disasters, there has been increased focus on emergency management and homeland security activities. Geospatial technology is widely used to more effectively mitigate the effects of and recover from disasters, natural or manmade. Geospatial information is used to understand natural or manmade risks and their effects before they happen, which is fundamental to mitigation and recovery

efforts. Accurate and real-time dissemination of shared geospatial data allows for informed decisions and faster emergency response times while providing first responders with enhanced situational awareness.

Climate Change – Alaska is experiencing the effects of climate change before other areas of the country and can be characterized as this nation’s canary in the coal mine. Accurate geospatial data, its distribution and management is vital to the responsible and accurate understanding of climate change by researchers. Predictive models, as well as adaptation and mitigation efforts, require accurate geospatial information and management. Accurate geospatial information is needed to monitor and measure phenomena such as sea level rise, coastal erosion, carbon flow, and changes in ice pack, which is essential to predictive modeling, mitigation and risk analysis. Over 200 population centers in Alaska are threatened and hydrographical changes are eminent.

Economic Development - A more coordinated GIS and the resulting information may allow for better inventory of energy resources, presenting opportunities for exploration of oil/ gas and renewable resources. There has also been interest in utilizing the Arctic seas for circumpolar shipping routes. Geospatial technology could aid in mapping navigable sea lanes and potential ports, which could increase Alaska’s transportation economy.

Natural Resource Management – There are many natural resources within Alaska and many stewards of these resources from the public and private sectors. There is an opportunity for these stakeholders to share information and develop new data and technologies to better support the management of these resources. Geospatial technology can help inventory and better manage these resources, helping to ensure they are used in an effective and sustainable manner.

Demand for Government Transparency – Increasing the availability of geospatial information can help make government operations and their decisions more transparent.

2.4.4 Threats

Limited Funding/ Resources for Geospatial Initiatives – Although budget limitations may present opportunities to use geospatial technology for more efficient operations, these limitations can also impact the funding and resources available to geospatial initiatives. This is a concern that has already affected many of the stakeholders participating in the planning process. Expenses for data, hardware, software, and staff may not be supported by individual agencies looking for ways to cut costs. In addition, although some federal programs have been recently prioritizing Alaska (including the GRAV-D program), others have not historically supported Alaska to the level that has been done in other parts of the U.S., including FEMA’s National Flood Insurance Program maps and the USGS’s National



Hydrology Dataset (NHD). These may impact the effective utilization and support of the technology.

Lack of Awareness of Geospatial Technology – There is not only a lack of awareness of geospatial technology within the stakeholder community, but also limited knowledge at the executive management and decision-maker level. The benefits of using the technology may not be clearly recognized by management and policy-makers, which may limit the support that these individuals are willing to give. In some instances, users of the technology may not be aware of the resources, including data, applications, and technical support, that are provided from different government agencies.

Pace of Changing Technology – Geospatial technology is advancing at an ever increasing rate. In order to take full advantage of the technology, significant attention needs to be given to the industry and the technology that is developing, while ensuring best practices are applied. Professional GIS practitioners require continuing education, presenting a challenge for academic institutions and the workplace to maintain a professional pace with rapidly unfolding advancements in the industry.

In summation, Alaska has many strengths it can expand upon, weaknesses it can improve upon and opportunities it can leverage, each of which have been carefully considered in evaluating how Alaska can best advance its geospatial agenda.

3 Strategic Foundation

The goal of this Plan is to establish a structure that meets Alaska’s geospatial needs in a collaborative manner. This strategic foundation sets forth a vision, mission, and goals to direct actions that will realize the statewide collaborative structure necessary to build a sustainable spatial data infrastructure for Alaska.

The vision statement communicates the collective desire for the future of the statewide geospatial framework and the mission provides an overview of what will be accomplished to achieve the vision.

Vision	Mission
<p>•Alaska will create a sustainable statewide geospatial framework to provide technology, policies, standards, and human resources necessary to help improve the sustainability, quality and availability of geospatial information to all Alaskans.</p>	<p>•Create a spatial infrastructure that will be supported by a participatory environment to facilitate collaboration and communication between all public and private stakeholders based on a philosophy of shared responsibilities, shared costs, shared benefits, and shared control.</p>

3.1 Strategic Goals

Four (4) strategic goals have been developed to help meet this vision and mission. Programmatic goals have been associated with each strategic goal to focus on specific activities required to accomplish the goal.

Strategic Goal 1: Establish a sustainable participatory governance structure to effectively and efficiently coordinate and communicate geospatial efforts.

The creation of a sustainable statewide geospatial structure to provide technology, policies, standards, and human resources (broadly known as a spatial data infrastructure) requires active communication and collaboration among all organizations involved in these activities. Much of the communication and collaboration necessary to achieve this vision can only be facilitated through a formal structure with broad stakeholder involvement and participation.

The organizational structure should be established to consolidate and prioritize spatial infrastructure needs, provide a common voice of the stakeholder community to potential funding organizations, establish standards, and validate best practices.



Strategic Goal 1, Programmatic Goal 1: Empower a representative body to coordinate and communicate geospatial efforts.

To create the legitimacy necessary to fulfill the roles envisioned for the coordination body it will be necessary for this body to be formally constituted, recognized and authorized under state government through legislation or executive administrative order.

The body of the Alaska Geospatial Council should be diverse and transparent enough to represent the stakeholder community without disenfranchising any segment of the stakeholder community, yet not so large it is incapable of being nimble or effective in planning and policy making efforts.

Representation on the Council should be of a high enough professional level among the sectors they represent to authoritatively influence budget requests and program development.

Strategic Goal 1, Programmatic Goal 2: Create, within state government, a full time position responsible for supporting statewide geospatial efforts.

Effective implementation of cooperative initiatives requires the involvement and focus of a full time professional. This professional, the Alaska Geospatial Information Officer,

would be ultimately responsible for the success of the coordination effort.

The Geospatial Information Officer will provide the support necessary for the Geospatial Council to function and will serve as the most visible champion of the statewide geospatial efforts. This leadership role will require a blend of public relations, attention to administrative detail, and the ability to build lasting partnerships between organizations. The Geospatial Information Officer will be the lead in implementing statewide geospatial initiatives and policies, while evangelizing their importance with stakeholders and executive leadership.

Strategic Goal 1, Programmatic Goal 3: Write and execute a business plan that will support a sustainable statewide geospatial coordination effort.

A sound business plan is critical to implementation of the geospatial coordination effort. This plan will identify priorities, suggest timelines, and clarify the resources necessary to build and maintain a sustainable spatial data infrastructure for Alaska that streamlines effectiveness and efficiency

Strategic Goal 1, Programmatic Goal 4: Establish working groups to provide guidance to leadership and other stakeholders on technical initiatives and policy issues.

The Alaska Geospatial Council will be comprised of individuals selected or appointed as representatives of particular agencies or organizations where they have sufficient authority to influence budgets and priorities. Serving in a position with a high level of authority within an organization suggests these representatives may not be intimately connected to the technical details necessary to manage a geospatial program.

As a representative body, the Council will not be large enough to have representatives and advocates from the entire breadth of the geospatial community. To provide the opportunity for involvement from the entire geospatial community, a series of technical working groups will be established. These groups will have membership drawn from the community to assure the full diversity of regional and institutional interests are considered while making recommendations on policy and technical issues.

Technical working groups will provide direct guidance to the Council through a formal reporting mechanism. These groups may be long term standing organizations meeting regularly or may be single issue or project related groups meeting only as necessary to support a specific project.

Strategic Goal 2: Ensure statewide spatial data and technology are available to as many potential users as possible and are developed, managed, procured, and coordinated according to best practices.

The effective use of geospatial technology is dependent on significant investments in data that are made accessible to stakeholders in a usable manner. Data acquisition is often cost prohibitive to single entities. Existing data are often not shared in a manner that is practical, resulting in lower or less effective use of the information, as well as additional effort to access and utilize the data.

Efforts should be made to develop and manage geospatial data in a coordinated manner. This should be achieved by accomplishing the programmatic goals below.

Strategic Goal 2, Programmatic Goal 1: Establish standards for framework geospatial data through a stakeholder driven process.

Although participants recognized entities need the autonomy to apply geospatial technology according to their specific needs, most agreed there are specific data and methods for sharing data that could be standardized.

Standards should be developed to build commonalities for data and technology that are produced by multiple entities.



These standards will allow for easier data integration, better understanding of data elements, and more effective data sharing.

Stakeholders should work to understand the data and technology that could benefit from standardization and establish one or more technical working groups to develop or adopt existing standards. Data formats, content, and structure (or schema) may be focus areas for standardization. In addition, geospatial technology, including web services and data transfer mechanisms, should be evaluated. These standards should be published and outreach should be performed to increase awareness. The Council should evaluate the establishment of incentives for conforming to these standards.

Strategic Goal 2, Programmatic Goal 2: Adapt or develop best practices for collaborative data collection, management, and distribution to fit Alaska's unique circumstances.

Geospatial data is being collected, managed, and distributed by many public and private entities throughout the state. These data and the methods used in support of these data may vary by geographic location, need, and organization, but could often benefit from guidance on adopted conventions and lessons learned from previous efforts. Incorporation of best practices will help reduce learning curves, improve the quality of data, and ensure

data are being developed and managed in a consistent manner.

Best practices should be adapted and developed for management, technical methodologies, and resources that are used for data efforts. These should focus on the full lifecycle of data including planning, definition of requirements, design and collection, quality control, and ongoing maintenance and distribution. Efforts should be made to publish and communicate best practices to the geospatial community through formal outreach activities. These best practices should also be adopted for activities performed under the auspices of the statewide coordinated effort.

Strategic Goal 2, Programmatic Goal 3: Establish mechanisms for supporting collaborative data development, coordination, validation, and data dissemination.

Various mechanisms are used to facilitate the development, coordination, validation, and data dissemination of geospatial technology. The Council should create and adopt mechanisms for use in collaborative efforts.

The Council should assist in developing formal agreements to help establish partnerships between various entities. In addition, the Council should provide contracting vehicles and formalized procurement processes to be leveraged for

procurement of software, hardware, data and services in a coordinated manner.

Strategic Goal 2, Programmatic Goal 4: Provide a unified clearinghouse for access to geospatial data that leverages existing capabilities.

Geospatial data are being provided via the internet through multiple federal, state, regional, and local government sources. Although some of these sites are integrating data from multiple sources (including the Alaska State Geospatial Data Clearinghouse and the SDMI's Alaska Mapped website), there are still gaps in available data and users experience difficulty in finding available data. Alaska does not yet have an authoritative location for finding and accessing geospatial data.

A single unified clearinghouse should be established to expand access to geospatial data via the internet. The clearinghouse should be sanctioned by the state and funded through the Council to warehouse and distribute data on behalf of the stakeholders, as licensed for dissemination and sharing, without charge to the titleholder. The Council should evaluate stakeholder needs and data that are currently being made available to determine gaps in data accessibility and potential areas for fusion of data access. Existing clearinghouses should also be reviewed to determine if these could be leveraged. Needed data should be either incorporated for storage and distribution in the clearinghouse, or provided via a

reference to another suitable web location from the clearinghouse. This effort will help increase awareness of existing data and improve access to these data.

Strategic Goal 2, Programmatic Goal 5: Facilitate the completion and maintenance of statewide framework geospatial data.

Framework geospatial data, including Cadastral (Parcels), Elevation, Geodetic Control, Hydrography, Political, Orthoimagery, and Street Centerlines, are commonly required to support many different business functions in Alaska and are essential for effective GIS activities. These datasets exist at various quality levels and at varying stages of completeness, but generally do not meet the needs of the majority of users. Coordinated statewide efforts are currently focusing on collection of some of the needed data. In addition, other federal, state, and regional efforts are underway to collect needed data. The Council should facilitate efforts to develop and maintain the statewide framework datasets.



Strategic Goal 3: Expand and improve the use and awareness of geospatial technologies through increased collaborative educational opportunities and outreach.

Stakeholders at all levels of organizations need to be educated about geospatial technology to ensure successful implementation. These stakeholders include:

- Executive decision makers need information to be able to prioritize and allocate investments for technology in the best interests of their organizations.
- Management needs to understand the applications for technology to effectively integrate the technology within their organization.
- Staff need training on the use and administration of the technology to effectively operate and maintain data and systems.
- Rural and remote stakeholders not possessing staff in sufficient quantity to qualify for travel incentives for trainers to train on site in rural locations.

In order to meet these needs, collaborative educational opportunities and outreach should be offered by accomplishing the programmatic goals listed below.

Strategic Goal 3, Programmatic Goal 1: Coordinate and increase awareness of professional development and training opportunities to empower the use of geospatial technology in a more effective manner.

Professional development and training opportunities are currently being provided by individual governmental entities for focused needs. These efforts could be coordinated to better meet mutual needs, increase participation, and reduce costs, in an effort to better educate geospatial professionals.

The Council should identify stakeholder needs for education, engage the University community, facilitate partnerships for coordinated training, help procure needed educational services, and inform the geospatial community of available opportunities.

Rural workforce development training opportunities are challenging due to limited departmental travel budgets and staffing insufficient in number to attract on-site training opportunities. The Council should consider evaluating essential continuing education and the impacts the purchasing power of a statewide program would have to negotiate on-site training for smaller rural governmental units who would otherwise find continuing education and training difficult.

Strategic Goal 3, Programmatic Goal 2: Increase awareness of the applications and benefits of geospatial technology through formal outreach activities.

Use and support of geospatial technologies will only be effective if executive management and staff are aware of the applications and benefits of the technology. The Council should establish outreach activities, including meetings and media outlets, to formally promote the application and benefits of the technology. These efforts will help incorporate the technology more fully into business processes and communicate the need for the technology to encourage additional investment.

Strategic Goal 3, Programmatic Goal 3: Continually evaluate and promote the application of new best practices and technologies.

Geospatial technologies are continually changing, providing opportunities to apply the technology differently and perform activities better. The Council should empower technical working groups or academic institutions to continually evaluate new technologies and make recommendations on how these technologies might be leveraged. This information should be used to promote these technologies, thus improving the geospatial community's awareness of options for integration into

their operations. Statewide coordinated efforts, including data collection and the clearinghouse, could also benefit from these efforts.

Strategic Goal 4: Identify and secure sustainable funding sources to support ongoing statewide geospatial programs.

Critical to the sustainability of any responsible geospatial program is ongoing funding to achieve a more factual, informed and cost effective decision and policy making platform based upon analysis. Often geospatial programs are viewed by funding entities as “projects” to be supported with short term funding without understanding the program will need to be supported over time and data needs to be maintained and refreshed on a regular and responsible cycle in perpetuity.

The goal of identifying and achieving sustainable funding to support a statewide geospatial program includes a focus on building consensus, cultivating collaboration, and establishing cost sharing partnerships. In this manner, sustainable state funding can be leveraged against “other” available funding sources and pooled to benefit the acquisition, development, management and distribution of geospatial data that supports taxpayer needs in a cost effective manner. This process also brings the best expertise to the table as reasonable funding entities wish to protect their investment(s).



Strategic Goal 4, Programmatic Goal 1: Establish strategic geospatial initiatives and priorities that build and support strong business cases for obtaining funding.

Traditionally large data collection efforts have been funded by a variety of federal, state, and local government cost sharing partners on an ad hoc basis. There have been examples where the lack of clear leadership and priority setting on the part of the state has made building partnerships difficult or resulted in multiple conflicting requests for similar financial support for competing initiatives. Establishing clear statewide priorities that grow out of a participatory governance process will eliminate this problem.

Priorities for programs must be established based on collective needs and based on business cases that clearly demonstrate the return on the investment.

Strategic Goal 4, Programmatic Goal 2: Secure a sustainable funding source to support the established statewide geospatial framework.

Once priorities and business cases have been developed, sustainable funding must be identified and secured to support the statewide spatial data infrastructure. Grant funding or other one-time sources of funds can be important to getting initiatives started but are insufficient to build a sustainable and robust spatial data

infrastructure. A sustainable and dedicated source of funding that is relatively free from year-to-year budget cycles should be sought to support the spatial data infrastructure including data development and maintenance, and the coordination effort.

Strategic Goal 4, Programmatic Goal 3: Establish formal partnerships for funding of geospatial initiatives.

Large geospatial initiatives are best implemented with a variety of stakeholders actively involved in establishing standards, best practices, and funding. Formal ongoing partnerships for funding help further geospatial initiatives through shared responsibilities, shared costs, shared benefits, and shared control.

These formal partnerships must include public and private stakeholders to assure that funding of the initiatives matches the benefits for partners.

4 Requirements

Achieving the strategic goals outlined will require a number of institutional and organizational changes. A coordination council will need to be empowered, a staff position for a GIO created, and sufficient sustainable funding secured. These requirements are broadly discussed in this document with the companion Business Plan providing additional detail for implementation.

4.1 Organizational Needs

Formation of Alaska Geospatial Council - In order to achieve the necessary participatory governance structure, the Alaska Geospatial Council will need to be created. The Council needs to be empowered through execution of an executive order or action to have the authority and responsibility to adequately address geospatial advancement, data acquisition, and sustainable funding to support the advancement of GIS in Alaska. These changes build upon previous successes and integrate existing geospatial interests inclusively.

Since the Council must function apart from the day-to-day responsibilities of maintaining a GIS for any particular agency, it should be housed outside of state departmental mainstream GIS environments to avoid a conflict of interest, whereby a departmental agenda could influence statewide priorities. It is important the administrative

home of the Council be viewed by the statewide GIS community as independent, transparent, and impartial to specific agency agenda and foster collaboration.

As a participatory governance body, the individuals appointed to the Council must represent the broader stakeholder community and be placed at a sufficient level in the management of the organization or institution they represent to influence budgets, cost sharing coalitions, and collaborative programs. These individuals should also have a basic understanding of the technology and support its use. Members of the Council should be appointed from representative agencies with significant GIS requirements in lands or infrastructure management and public safety. Appointees should be representative of state, federal and local governments, while including tribal representation and utilities. Representatives from professional organizations that have geospatial requirements should also be appointed to serve on the Council to represent those stakeholder groups.

Alaska Geospatial Information Officer (GIO) - The position of GIO should be created within the organization identified to serve as the institutional home of the Council. The success of statewide coordination efforts depend on their becoming the full time professional responsibility of this individual. The skills necessary for this position include an

understanding of geospatial systems and data, combined with the ability to negotiate agreements between organizations, and serve as an evangelist and facilitator for geospatial technology and coordination.

Although it is anticipated the Geospatial Information Officer will be the primary staff support for the Council, it may be necessary to have additional administrative support for the operation.

Create Technical Working Groups - In order to assure the Council has sufficient technical input from the stakeholder community, working groups should be constituted with a charter from the Council to provide the necessary input. The membership of these groups must be carefully chosen to represent the full diversity of needs within Alaska. They should include representation from a variety of levels of government, tribal interests, and the private sector along with not for profits and universities. Regional diversity should also be sought to make certain that varying needs across the state are recognized. These working groups will provide technical input to support the decisions and programs of the Council and will work with appropriate persons or bodies within state agencies to accomplish their goals.

4.2 Policies, Standards, and Best Practices

Alaska Geospatial Council Charter - A number of policies, best practices, and standards will need to be ratified by the Council. Primary among these formal documents will be the charter of the Council. It will need to specifically spell out the powers and role of the Council relative to its authority for implementation of standards, policies, and best practices. It should make clear the Council has the authority to review and adopt best practices, but enforcement is not within the authority vested in the Council.

Technical Working Groups' Role- Once empowered, the Council should develop specific charters for technical working groups so they have a clear understanding of their role in the function of the Council. These charter documents should spell out the role of the groups and the specific deliverables expected. Working groups should be immediately empanelled to develop standards and best practices documents to support the development of statewide framework datasets.

Best Practices Review and Adoption - Best practices adoption should include a thorough review of existing standards and practices as established by federal authorities such as the FGDC. This review should make certain the unique nature of Alaska does not make those standards and practices impractical or impossible to implement.

Technical working groups should either recommend adoption of existing standards and best practices, recommend revisions to those documents to meet Alaska's needs, or develop new documents. The results of these reviews should be provided to the Council with specific recommendations for adoption. The recommendations should, whenever possible, identify the benefits to be gained by the implementation of the standards or best practices. These benefits should be enumerated as a return on investment whenever possible.

Sample Agreements, Contract Vehicles, Procurement -

A variety of additional documents and policies will need to be developed to implement a truly successful geospatial coordination effort.

The ability of the Council host agency to procure services based on contributions from public and private partners to support multi-year projects will need to be established. This may require changes to procurement legislation and policies.

To facilitate procurement of geospatial services and data by public organizations, appropriate contract vehicles should be established that can be used by all parties to procure software, hardware, data, and services. These contracts would benefit from economies of scale so participants would receive a more competitive price for the items procured. Additionally, the approved vendors would

already have been vetted by appropriate experts so compliance with best practices and standards would be assured. Services and data could also be procured more quickly, since contracting vehicles will be in place.

4.3 Communication and Outreach

A key component of successful geospatial coordination is effective and on-going communication and outreach to the community. A marketing and outreach plan should be created that outlines a comprehensive and on-going program. Resources necessary to create this plan are primarily time and administrative support from the Council host agency and the Geospatial Information Officer.

The Council will need to establish a web presence to provide an initial source of information for the community. This web site must include a searchable database of GIS professionals to make contact and communication between individuals with similar concerns and interest possible. Other features that should be included are a directory of training opportunities, links to geospatial clearinghouses, a repository of standards and best practices that have been approved or endorsed by Council, and marketing material (presentations, one page flyers, etc.) that can be used by members of the community to help build support for statewide geospatial initiatives.

Regional GIS stakeholder meetings should be held at least once a year where the GIO has an opportunity to meet stakeholders and discuss on-going initiatives and their

regional concerns. This will require an annual travel budget as well as administrative support.

4.4 Statewide Framework Data

Financial resources will be needed for the development of statewide framework data. Businesses cases should be engaged to support the development of statewide Cadastral, Elevation, Geodetic Control, Hydrography, Administrative, Orthoimagery, and Transportation data. Appropriate standards and best practices must be developed, approved, and widely shared.

Resources will be required for quality review of these datasets and for the distribution of data via a web-based geospatial clearinghouse.

Ongoing resources will be required to maintain the base layers once they have been collected. The regularly scheduled 'refresh' of data is important since it represents a shift of the current manner of conducting business.

4.5 Unified Clearinghouse

While many of the datasets required by GIS users throughout the state area are available, there is some confusion as to the location of these data and how they may be best acquired. The GIS community would be well served by having access to a single web-based clearinghouse that provides access to data or references useful data housed in other locations.

These efforts must be based on a careful assessment of current user needs, the technology in place at existing clearinghouses, and the needs for security and redundancy in case of a statewide emergency. The implementation of the clearinghouse should consider web accessibility and internet connectivity across the state and have measures for meeting these needs.

Resources will be required to complete an assessment of the stakeholder community and to fully document the technical needs and user interface requirements. Much of this work could be accomplished by a Technical Working Group assigned to this task. In addition to this work, a full evaluation of technologies currently in use should be completed to leverage the existing spatial data servers and clearinghouses in operation.

It is possible that the current clearinghouses do not have robust enough infrastructure to handle user demands over time or are not sufficient from a technology or software perspective to meet anticipated requirements. If this is the case, funding will be required to build a sufficient clearinghouse for Alaska.

5 Implementation Program

To effectively support statewide GIS coordination, a number of initiatives will need to be accomplished that are closely linked to the strategic and programmatic goals outlined in this report.

These implementation initiatives form a comprehensive work program that establishes a framework for specific work activities necessary to accomplish a sustainable geospatial coordination effort in Alaska.

This section presents the implementation initiatives and assigns a priority 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 designations 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 2012.
- **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 2013, or sooner if possible.
- **Moderate (M)**—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 2014, or sooner if possible.
- **Low (L)**—Important for overall success of coordination, but there is flexibility in work scheduling given resource and time limitations. These initiatives should be scheduled and work initiated as resources permit with projected completion by the end of 2015.



5.1 Organizational and Management Initiatives

The success of any statewide GIS program is largely dependent on the strength and stakeholder support of the organization and management structure supporting implementation.

An organizational and management structure that encourages more active involvement from all GIS

stakeholders in Alaska will greatly enhance the likelihood of success for any responsible initiative undertaken. The initiatives outlined below in Table 4 are intended to build the environment necessary to encourage, nurture, and grow collaborative efforts.

Implementation Initiatives—Organizational Needs	
Implementation Initiative	Priority
O1: Create an Alaska Geographic Information Council. Appoint members to the Council, establish working procedures, and Council charter.	VH
O2: Create and fill a full time position of the Geospatial Information Officer	VH
O3: Identify and establish initial Technical Working Groups under the Council	VH

Table 4- Implementation Initiatives - Organizational Needs

5.2 Policies, Standards, and Best Practices

A series of policies, standards, and best practices must be approved by the Council as recommended by appropriate Technical Working Groups. The initiatives outlined in Table 5 are intended to serve as an initial listing of those that will need to be developed and implemented.

Implementation Initiatives—Policies, Standards, and Best Practices	
Implementation Initiative	Priority
P1: Define/document process for GIS standards and policy development and approval	VH
P2: Develop and approve formal GIS policies	H
P3: Develop, approve, and support the use of GIS database standards	H

Table 5 - Implementation Initiatives—Policies, Standards, and Best Practices



5.3 Communication and Outreach

Communication, outreach, and education are important to a successful statewide coordination effort. Decision makers and GIS professionals in Alaska need to be connected to the statewide GIS coordination effort to insure success.

Many GIS professionals and decision-makers currently do not see the value in participating in a statewide geospatial effort. Often they view data and applications they have developed as proprietary property to be protected or sold for the benefit of their jurisdiction or organization. While those assets are in fact valuable, their value is significantly

enhanced through multiple uses of the data that improves public and private decision-making at all levels. Benefits to local government through participation in a statewide initiative must be clearly identified and communicated.

It is the goal of these implementation strategies to build an understanding among the GIS stakeholder community that there are clear and significant benefits to be gained from participating in a statewide coordinated geospatial effort and those benefits substantially outweigh the costs of the coordinated GIS program.

Implementation Initiatives—Communication and Outreach	
Implementation Initiative	Priority
C1: Complete a communication and marketing plan for the state spatial data infrastructure.	VH
C2: Actively pursue outreach to, and support from, professional and industry associations	VH
C3: Prepare materials and hold briefings to sustain support from senior officials	VH
C4: Reach consensus on name, logo, and other branding for Alaska’s statewide GIS program	M
C5: Design and create promotional materials for statewide GIS program	VH
C6: Develop a website for improved access to information, services, and resources	VH
C7: Prepare and maintain a single web-based GIS contact directory	H
C8: Support and encourage expanded participation in GIS events and professional associations	H
C9: Create and maintain a central, web-accessible repository for GIS and related IT standards and policies	H
C10: Encourage and support professional development and certification for GIS professionals in Alaska	M
C11: Encourage and expand participation in and programs offered by the Alaska Geographic Data Committee	M
C12: Communicate GIS project initiatives, successes, lessons-learned, and best practices through media, web site, conferences, and professional meetings	M
C13: Compile and maintain a directory of GIS training sources and opportunities	M
C14: Prepare GIS education/training plan and put in it in place	H

Table 6 – Implementation Initiatives - Communications and Outreach

5.4 Statewide Framework Data

To support the strategic goal of completion and maintenance of statewide framework data, a number of initiatives should be undertaken. These initiatives would

supplement data development efforts already underway, expand the geographic coverage of framework layers, and initiate cooperative projects to develop new layers.

Implementation Initiatives—Statewide Framework Data	
Implementation Initiative	Priority
D1: Expand the Geographic Data Library to maintain a web-based catalog of sources of geographic data.	M
D2: Design and put in place a data stewardship model and practices applicable to all GIS data.	VH
D3: Evaluate current quality of Framework data and define actions for quality improvement of those data over time.	H
D4: Develop, approve, and support the use of GIS database standards.	H
D5: Develop template database specifications and procurement templates for new data themes.	M
D6: Create geospatial metadata profile(s) and develop more effective metadata management tools.	H
D7: Support creation of current statewide elevation data.	VH
D8: Establish program and process for ongoing repeatable statewide coverage of orthoimagery.	VH
D9: Design, develop, and deploy a statewide cadastral database and establish ongoing stewardship	H
D10: Enhance accuracy/ completeness of administrative boundaries (city, townships, school districts, election districts, and other special purpose districts).	H
D11: Complete and enhance an integrated hydrography dataset for the state.	H
D12: Complete an integrated statewide transportation dataset.	H
D13: Complete and integrated and enhanced Geodetic Control dataset.	H

Table 7 - Implementation Initiatives - Statewide Framework Data



5.5 Unified Data Clearinghouse

A unified clearinghouse will act as a single point-of-entry to statewide geospatial data in Alaska, allowing users to easily find information and trust that the data are authoritative datasets for the state. Hosting data from multiple sources within this clearinghouse will also reduce redundancies in data storage and offer opportunities for sharing of technological resources.

The establishment of the unified clearinghouse must include an analysis of user needs for the website, user capabilities and technical limitations, and the capabilities of existing statewide clearinghouses to meet these needs. This can help determine a technology solution that is right for Alaska, which can be used to build a business case for developing and maintaining the clearinghouse into the future.

Implementation Initiatives—Unified Data Clearinghouse	
Implementation Initiative	Priority
U1: Evaluate stakeholder needs for a unified geospatial data and metadata clearinghouse.	VH
U2: Evaluation of the technology in place at existing data clearinghouses in Alaska.	H
U3: Develop a sound business case for building and maintaining a unified clearinghouse.	M
U4: Identify sustainable funding for the unified clearinghouse.	M

Table 8 - Implementation Initiatives—Unified Data Clearinghouse

5.6 Sustainable Funding

The ability to identify sustainable funding for the coordination and development of statewide framework data will have a large impact on the long term success of

the effort. A number of activities can be undertaken to maximize the potential for achieving the necessary funding over the long term.

Implementation Initiatives—Sustainable Funding	
Implementation Initiative	Priority
F1: Research and secure additional grant funding to support state and local GIS development	VH
F2: Explore and pursue new funding sources for GIS development support through local land transaction registration fees	H
F3: Research and identify other funding sources or financing strategies for GIS programs	H
F4: Explore, identify, and facilitate access to non-traditional staff resource options, including part-time or seasonal positions, student internship/coop programs, “borrowed staff” from other agencies to support GIS projects, volunteer staff, contracted labor, etc.	M
F5: Prepare business case for open access to GIS data	VH
F6: Prepare template agreements and management practices for multi-organization cost sharing	M

Table 9 - Implementation Initiatives—Sustainable Funding





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Appendix A: Strategic Planning Methodology

The approach used for this strategic planning effort was driven by the goal of engaging stakeholders throughout the state in an open and transparent manner, working to ensure stakeholder's needs and ideas were used as the foundation for the resulting plans. Each of the tasks were executed with guidance from the Federal Geographic Data Committee's Strategic Planning Process Map (see http://www.fgdc.gov/policyandplanning/newspbp/StrategicPlanningProcessMap_v2_052809_FinalVersion.pdf).

The state of Alaska was awarded the CAP grant in 2010 and hired Dewberry in 2011 to facilitate the effort and develop the strategic plans.

An executive committee, headed by project management from the state of Alaska, was developed to ensure project decisions were made with the interests of key stakeholders in mind. This Steering committee included:

- **Nick Mastrodicasa, Project Manager**, Alaska Department of Transportation & Public Facilities
- **Anne Johnson, Assistant Project Manager**, Alaska Department of Natural Resources
- **Bill Hazelton**, University of Alaska Anchorage
- **Bill Holloway**, Kenai Peninsula Borough
- **Garth Olson**, Bureau of Land Management

- **Shannon Post**, Matanuska-Susitna Borough
- **Scott Van Hoff**, US Geological Survey

This committee managed and reviewed the key tasks and deliverables of this effort, each of which are depicted in figure 6 and further described below.



Figure 6 - Strategic Planning Process

Online Survey

An online survey was conducted to gather input from all stakeholders within Alaska. This feedback from this survey revealed:

- Information about how geographic information is being used
- Business functions and programs that are being supported with geospatial technology
- Reasons for using geospatial technology and the benefits being realized from the technology
- Existing resources, data, and technology available to support geospatial operations
- Needs of stakeholders for geographic information
- Suggestions for improving geospatial capabilities of the state

The online survey was hosted on SurveyMonkey.com from March 2nd to March 28th 2011. Five emails were sent to 952 individuals within the geospatial community, inviting and reminding these individuals to complete the survey. The survey deadline was extended an additional three days to attempt to acquire responses from those that were not able to complete the survey within the initial timeframe. In total, 289 individuals responded to the survey.

Representatives from all organizations in the geospatial community participated in the survey. As shown in figure 7, these organizations included state, federal, and local government, as well as the commercial sector, universities/ educational institutions, not-for-profits, utilities, native corporations, professional/ trade associations, special purpose districts, and public school districts. The majority of the respondents represented federal and state government.

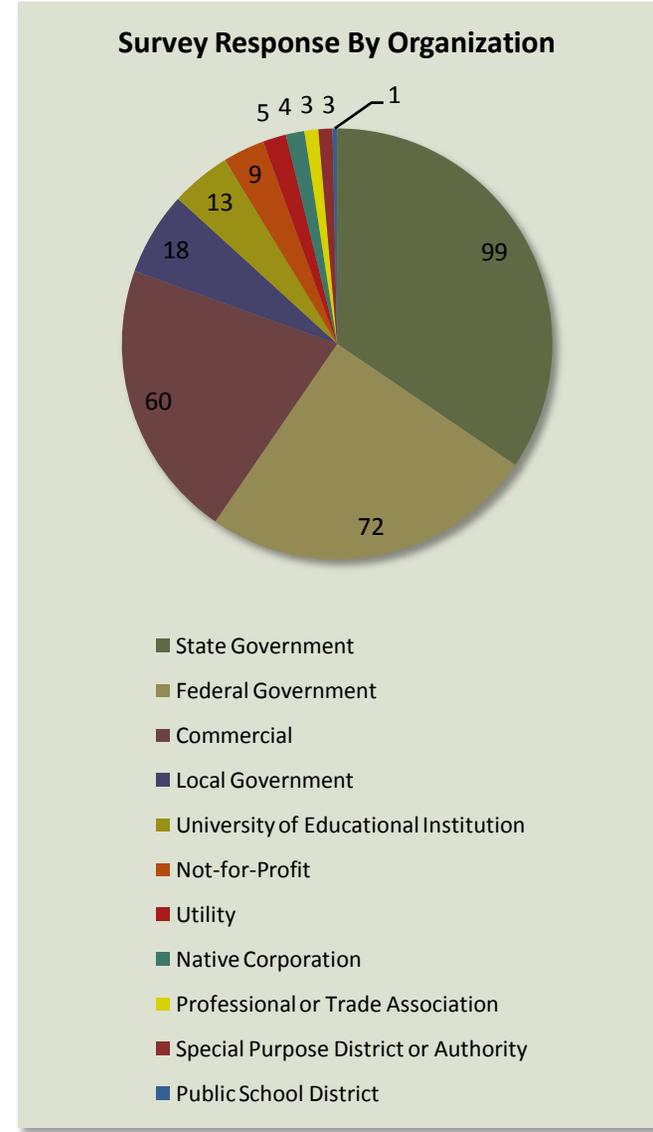


Figure 7 - Survey Response by Organization

Survey respondents were located around Alaska, with most from the major population centers. The map in Figure 8 shows the locations of the respondents by zip code.

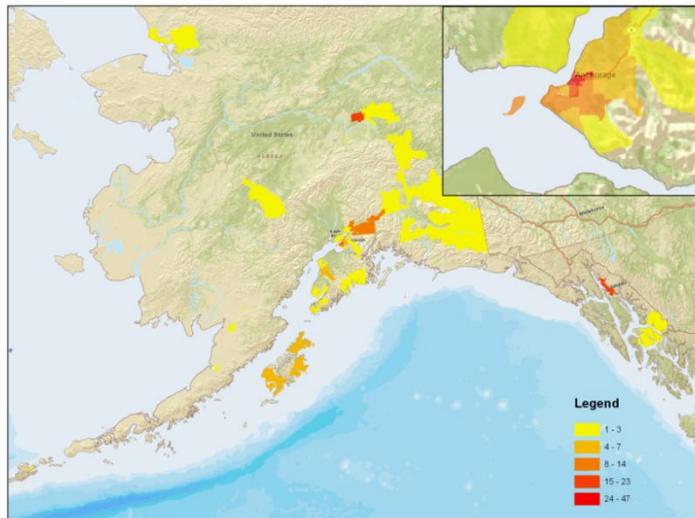


Figure 8 - Location of respondents by zip code. Anchorage inset included to depict detail not conveyed in larger map.

The results of the survey were summarized and distributed to the Steering Committee for review. A summary of these results was also presented during the regional stakeholder workshops, discussed below.

Regional Stakeholder Workshops

Workshops were conducted around Alaska, including Anchorage, Fairbanks, Juneau, Kenai, Kodiak, and one virtually, in order to gather input from the community for these plans. These meetings featured an open dialogue about the status of geospatial coordination in Alaska and what can be done to improve the benefits of applying the technology, data, and human resources in the state. These workshops gave insight into the current state of geospatial initiatives within the state and helped gather ideas for how these initiatives might be improved in the future.



Figure 9 - Locations of Stakeholder Workshops

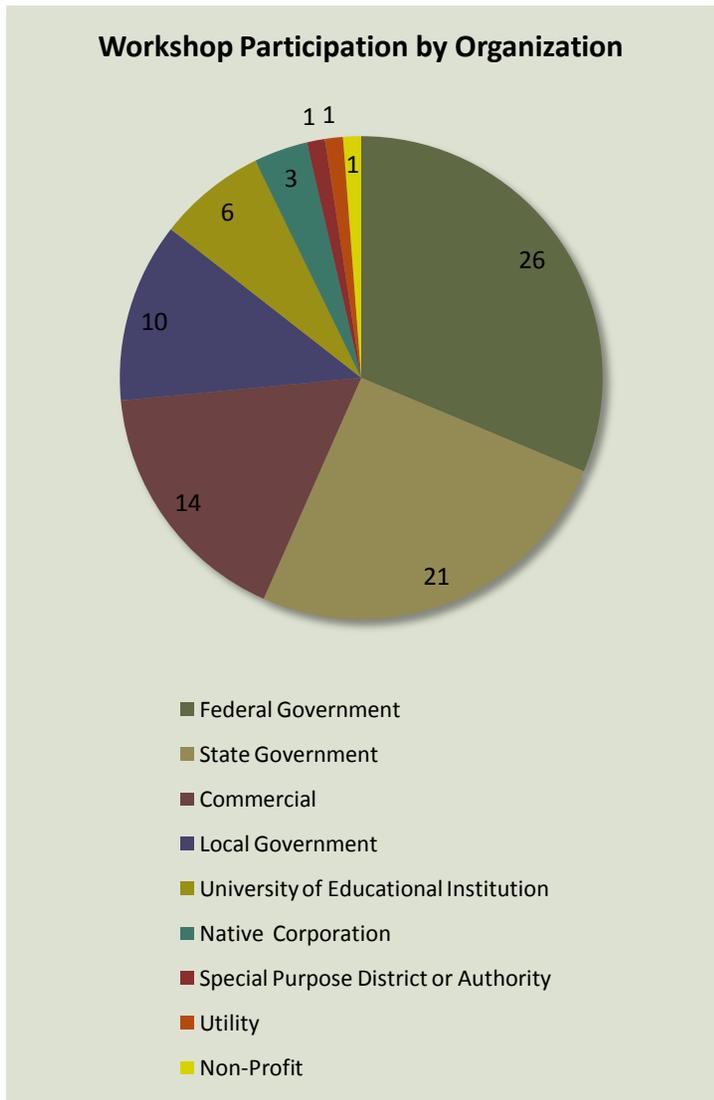


These workshops focused on the following discussion topics:

- **Overview of Strategic and Business Plans** – Introduction by the project team to the project goals, process, and expectations.
- **Process for Developing the Plans** –The project team reviewed the methodology used for the project and the projected schedule of task completion.
- **Evaluation of Alaska’s Geospatial Coordination and Collaboration** – Facilitated discussion on the things that are working well in the state, things that could be improved, opportunities for enhancement, and threats to achieving coordination goals.
- **Future of Alaska’s Geospatial Coordination** – Facilitated discussion on the roles, structure, and actions of a statewide coordinating entity
- **Current Geospatial Operations** – Facilitated discussion on the business drivers, benefits, and challenges associated with geospatial technology.

The physical workshops were held from April 5th to April 15th 2011. An additional virtual workshop was held on April 27th 2011 for those that were unable to attend the workshops in person. Three (3) emails were sent out to 952 individuals inviting and reminding them to register

and attend the workshops. An agenda was sent to those that registered for a workshop.



In general, each of the workshops was well attended. A total of 83 people attended the workshops, with 42 attendees at Anchorage, 12 attendees each at Fairbanks and Kodiak, 10 attendees at Juneau, and 6 attendees in Kenai. These individuals represented similar organizations to those that completed the online survey, as shown in Figure 10.

The results of these workshops were summarized in individual reports. These reports were sent out to each of the workshop participants for comment to ensure that the information was captured appropriately. The resulting information was then summarized for all of the workshops and presented to the Steering Committee for review.

Figure 10 - Workshop Participation by Organization



Executive Management Interviews

Interviews were conducted with representatives from federal, state, and local government, as well as commercial and university organizations. These interviews gave insight into the current state of geospatial initiatives within the state, as well as help gather ideas for how these initiatives might be improved in the future.

Interviews were conducted with 18 individuals over the course of two weeks. These individuals were chosen by the project evaluation team to represent the viewpoints and concerns of the major stakeholders of geospatial information in Alaska. These interviews included four federal government representatives, four state government representatives, three local/ regional government representatives, three academia representatives, and one state legislature representative. These individuals are either executive management or in a leadership role within their respective organizations. Table 10 lists those that were interviewed.

The information collected from these interviewees was summarized in a report by topic and submitted to the Steering Committee for review.

Plan Authoring

The resulting information from the surveys, workshops, and interviews has been used to compile this Strategic Plan and will assist in the development of the following Business Plan.

Interviewee	Organization	Position
Representative Eric Feige	Alaska House of Representatives	State Representative
John Cramer/ Pat Shier	Alaska Department of Administration	Deputy Commissioner/ Enterprise Technology Services Director
Kurt Kamletz / Jason Graham	Alaska Fish and Game	IT Manager/ Cartographer
Greg Light/ Cliff Jones	Alaska Department of Environmental Conservation	Information Technology Manager / GIS Coordinator
James Hemsath/ Peter Crimp	Alaska Industrial Development and Export Authority/ Alaska Energy Authority	Development Finance Program Deputy Director/ Alternative Energy & Energy Efficiency Deputy Director
Tom Duncan	Fairbanks Borough	GIS Coordinator
Doina Nica/ Lance Ahern	Anchorage Municipality	GIS Data Manager/ CIO
Paul VanDyke	Kodiak Island Borough	IT Supervisor
George Sempeles	FAA	Lead National Cartographer
Matthew Forney	NOAA/NGS	NGS Liaison to Alaska
Rob Beachler/ Heidi Nelson	Joint Forces - Military GIS User Group	
Dr Mark Myers	University of Alaska Fairbanks	Vice Chancellor-Research
Tom Case	University of Alaska Anchorage	Vice Chancellor
Gennady Gienko	University of Alaska Anchorage	UA Geomatics Professor
Robert Ruffner	Kenai Watershed Forum	Executive Director
Charles Parker	Alaska Village Initiatives	President/ CEO
Mike Plivelich / Sanjay Pyare	Southeast Alaska GIS Library	GIS Coordinator/ Professor
Ruth Monahan/ Andrea Gehrke / Erik Johnson	USDA Forest Service	Deputy Regional Forester / Information Management Director/ Geographic & Resource Information Systems Group Leader

Table 10 - Executive Management Interviewees

Appendix B: Abbreviation Glossary

Abbreviation	Description
ACSM	American Congress on Surveying & Mapping
ADFG	Alaska Department of Fish & Game
ADGDC	Alaska State Geospatial Data Clearinghouse
AEA	Alaska Energy Authority
AGDC	Alaska Geographic Data Committee
ASPLS	Alaska Society of Professional Land Surveyors
ASPRS	American Society of Photogrammetry and Remote Sensing
ASTER	Advanced Spaceborne Thermal Emission and Reflection Radiometer
BLM	Bureau of Land Management
CAP	Cooperative Agreement Program
CEO	Chief Executive Officer
CIO	Chief Information Officer
DCCED	Alaska Department of Commerce, Community, and Economic Development
DEC	Alaska Department of Environmental Conservation
DEM	Digital Elevation Model
DMVA	Alaska Department of Military and Veterans Affairs
DNR	Alaska Department of Natural Resources
DoD	Department of Defense
DOQQ	Digital Orthophoto Quarter Quads
DOT&PF	Alaska Department of Transportation & Public Facilities
DPS	Alaska Department of Public Safety
EPA	Environmental Protection Agency
ETS	Enterprise Technology Services
FAA	Federal Aviation Administration
FGDC	Federal Geographic Data Committee
FTP	File Transfer Protocol
GINA	Geographic Information Network of Alaska

Abbreviation	Description
GIO	Geospatial Information Officer
GIS	Geographic Information System
GPS	Global Positioning System
GRAV-D	Gravity for the Redefinition of the American Vertical Datum
HSS	Alaska Department of Health and Social Services
IARPC	Interagency Arctic Policy Research Center
LiDAR	Light Detection And Ranging
NED	National Elevation Dataset
NGA	National Geospatial-Intelligence Agency
NGS	National Geodetic Survey
NHD	National Hydrography Dataset
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRCS	National Resources Conservation Service
NSDI	National Spatial Data Infrastructure
NSGIC	National States Geographic Information Council
RMSE	Root-Mean-Square Error
SDMI	Statewide Digital Mapping Initiative
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TIGER	Topologically Integrated Geographic Encoding and Referencing system
TWG	Technical Working Group
UAF	University of Alaska Fairbanks
UAS	Unmanned Aerial Systems
URISA	Urban & Regional Information Systems Association

