CASE STUDY

Anchorage, Alaska

Goals

- Leverage spatial and related data to improve municipal business practices.
- Improve access to municipal GIS data.
- Promote coordinated and effective use of GIS and database technology throughout the municipality.
- Promote open communication and involve stakeholders in the decision-making process.

Results

- Significant reduction in redundant data capture and management efforts in all areas
- More accurate, consistent data stored in a data repository accessible by many departments
- Better coordination among departments and agencies throughout the municipality
- Better support for mission-critical operations, particularly public safety
- Faster, better information access

Nearly everyone in Anchorage, Alaska, can tell you what happens the first Saturday in March. Since 1973, this day in the late winter has marked the beginning of the world-famous Iditarod. The Iditarod, the world's premier sled dog race, begins in Anchorage and winds its way for 1,100 miles through the Kuskokwim Mountains then along the Norton Sound to its finish in Nome, Alaska. With its competitors, human and canine alike, facing harsh terrain, bitter cold temperatures, bone-chilling winds, and the constant threat of bear attacks, the race is one of the greatest tests of courage and endurance in all of modern sport. But Anchorage is much more than just the starting point for this renowned sporting event. This city on the Cook Inlet in southern Alaska is home to more than 40 percent of the people in the state—about a quarter of a million people. It is the commercial, banking, transportation, and cultural center of Alaska. Though most Americans may never visit their 49th state, most that do will spend at least part of their time in Anchorage.

The Municipality of Anchorage (MOA) includes the city itself plus the outlying areas of Birchwood, Chugiak, Eagle River, Eklutna, and Girdwood. Unlike most other "Lower 48" cities, Anchorage is not part of a county or borough—the municipality is a single jurisdiction covering a large area. The area contained by the municipality is nearly 2,000 square miles, which is approximately the size of the state of Delaware!

To assist in the running of a municipal government with a large, diverse population covering an enormous area of land on the edge of a fragile ecology, the municipality has been using geographic information system (GIS) technology by ESRI for more than two decades. Although the path they have taken to develop an enterprisewide GIS has not been as arduous as the Iditarod, it has required some perseverance and dedication.

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An Enterprise GIS is Born

The Municipality of Anchorage has a long history of GIS use beginning in 1978 with a feasibility study conducted by ESRI. In 1982, the Department of Community Planning and Development acquired one of the first licenses of ESRI's ArcInfo installed in the Planning Department. The Department of Public Works (DPW) installed hardware and non-ESRI software in March 1984. Both departments made good use of their respective systems, but the inability to share data between these dissimilar systems was soon seen as a hindrance to maximizing the cost-effectiveness of GIS technology.

In 1989, DPW recognized the limitations of its software and began the process of converting its data to ESRI's ArcInfo coverage format. This required a substantial conversion effort, which was completed in 1992. Since then, the Anchorage Water and Wastewater Utility (AWWU) has also acquired ArcInfo software and made a significant investment in GIS. With the availability of desktop GIS programs, such as ArcIMS and ArcView, more departments are starting to realize the benefits of using GIS on affordable personal computers.

The drive to develop an enterprise GIS began in 1992 with the efforts of a GIS Steering Committee, which defined a strategic memorandum outlining a "corporate GIS." Corporate GIS is the concept that a centralized group can more cost-effectively serve an entire organization. Although the process began in 1992, it was not until 1997 that a Corporate GIS Division was formed within the Information Technology Depart-

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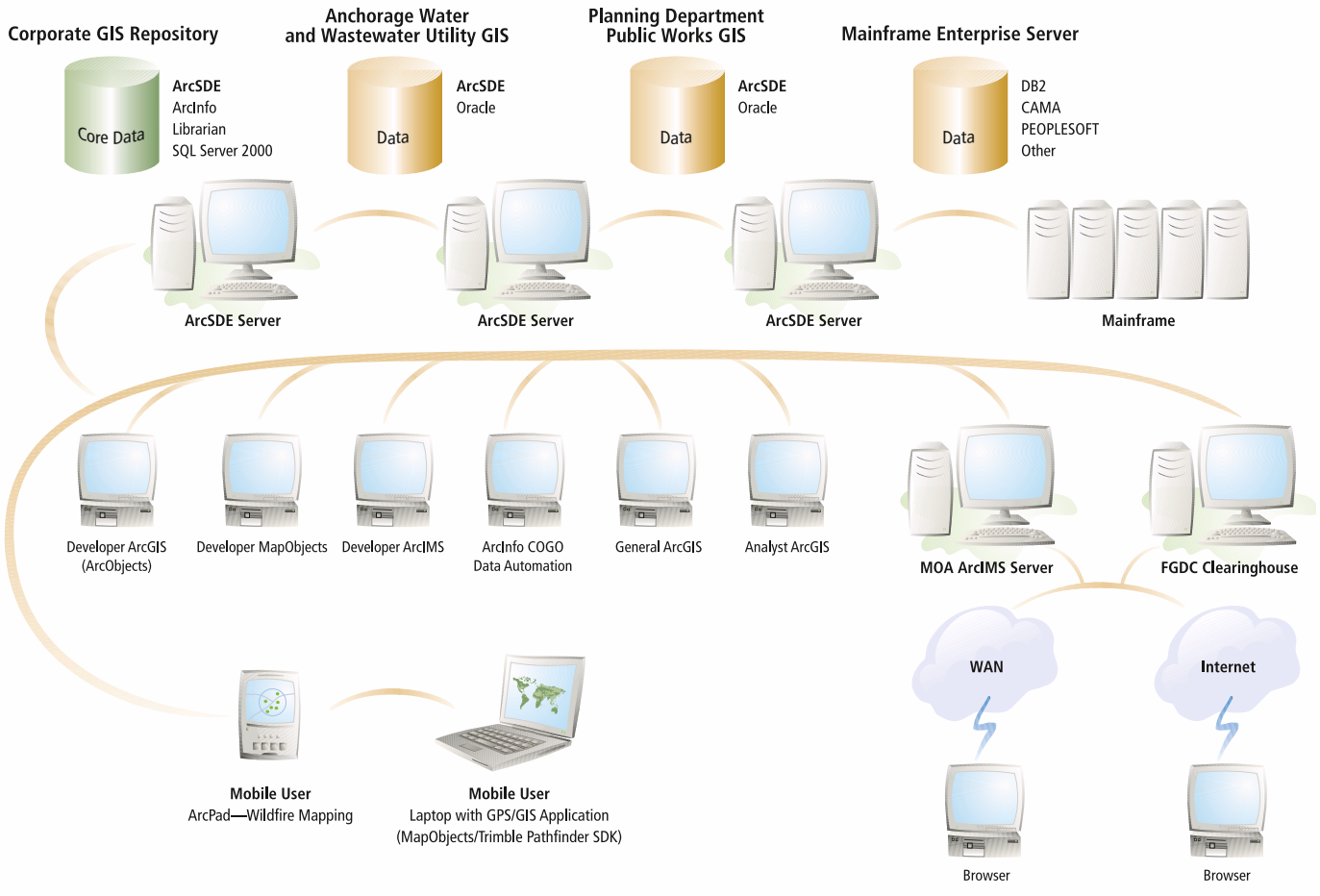
Municipality of Anchorage, Alaska System Configuration



CASE STUDY

Anchorage, Alaska

Benefits

- Great reduction in redundant data capture and management efforts in all areas
- More accurate, consistent data stored in a data repository accessible by many departments
- Better coordination among departments and agencies throughout the municipality
- Better metadata
- Enterprise databases using the power of geography to integrate them and a warehouse system to distribute the data
- Better support for mission-critical operations, particularly public safety
- Faster, better information access
- Greater recognition of GIS in the municipality

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ment. At that time, the municipal manager tasked the Steering Committee with funding and staffing this division.

ESRI was contracted in 1997 to analyze the GIS situation at MOA and make recommendations regarding organization, resource needs, and GIS use. The ESRI study was then used to hire a corporate GIS manager in 1998. Since 1998, the corporate GIS has been steadily progressing and gaining more recognition and respect within the municipality.

One of the first initiatives of the Corporate GIS Division was to establish a corporate GIS repository containing formally defined core layers, or a framework. In conjunction with the repository, a test of ArcSDE was initiated including a test of various relational database management systems. Currently, MOA uses ArcSDE to manage its core GIS layers with the exception of parcels, subdivisions, and roads, which are maintained using ArcInfo Librarian.

Another major challenge and project undertaken by the Corporate GIS Division is to integrate the core GIS layers and MOA's critical property data into one relational database system. This project is called the Land Information System and forms the backbone of MOA enterprise GIS. The project is currently in Phase 2, which includes a migration of the core GIS data to the new geodatabase format.

Organization

The municipality has organized a centralized GIS group it calls "Corporate GIS," managed jointly by the Information Technology Department GIS/database manager and the Public Works/Planning Department e-government manager. The Corporate GIS team is made up of 12 professionals who are Information Technology Department and Planning and Public Works Department employees. This corporate team was recently consolidated into one physical location to better enhance teamwork and data sharing. The team specializes in GIS applications, mapping, data publishing, information access, database management, and GIS professional services.

An annual Corporate GIS Strategic Plan guides the corporate GIS. This plan specifies the mission statement, vision, goals, objectives, and a work plan. Management of staff time and capital budget is correlated to specific goals and a work plan. In addition, a set of corporate GIS "direct services" is defined into a series of service levels. The funding for corporate GIS comes from various departments within the municipality. The service level definition is used when charging departments for corporate GIS. A department is charged a percentage of the corporate GIS budget, depending on the number of service levels used by that department.

By centralizing its resources and efforts and reducing the overlap in GIS functions, MOA is able to provide quality services and data to more of the enterprise with less cost. Establishing a corporate GIS required a great deal of political work over five years, primarily convincing independent departments that a corporate group would act in everyone's interest, not just one department. The Corporate GIS team acts as a central resource to support the municipality's many departments and their specific needs.

The Corporate GIS group supports the municipality's other departments by providing expertise in GIS and database technologies, managing MOA's core data, and ensuring access to corporate GIS data. MOA is an adherent of the Federal Geographic Data Committee (FGDC), using the FGDC metadata standards, establishing an FGDC Clearinghouse, and using a core data framework following FGDC's guidelines. The major MOA stakeholder departments manage their own business rules and, in some cases, their own databases. The role of Corporate GIS is to ensure common technology standards and sharing of data follow consistent standards and protocols.

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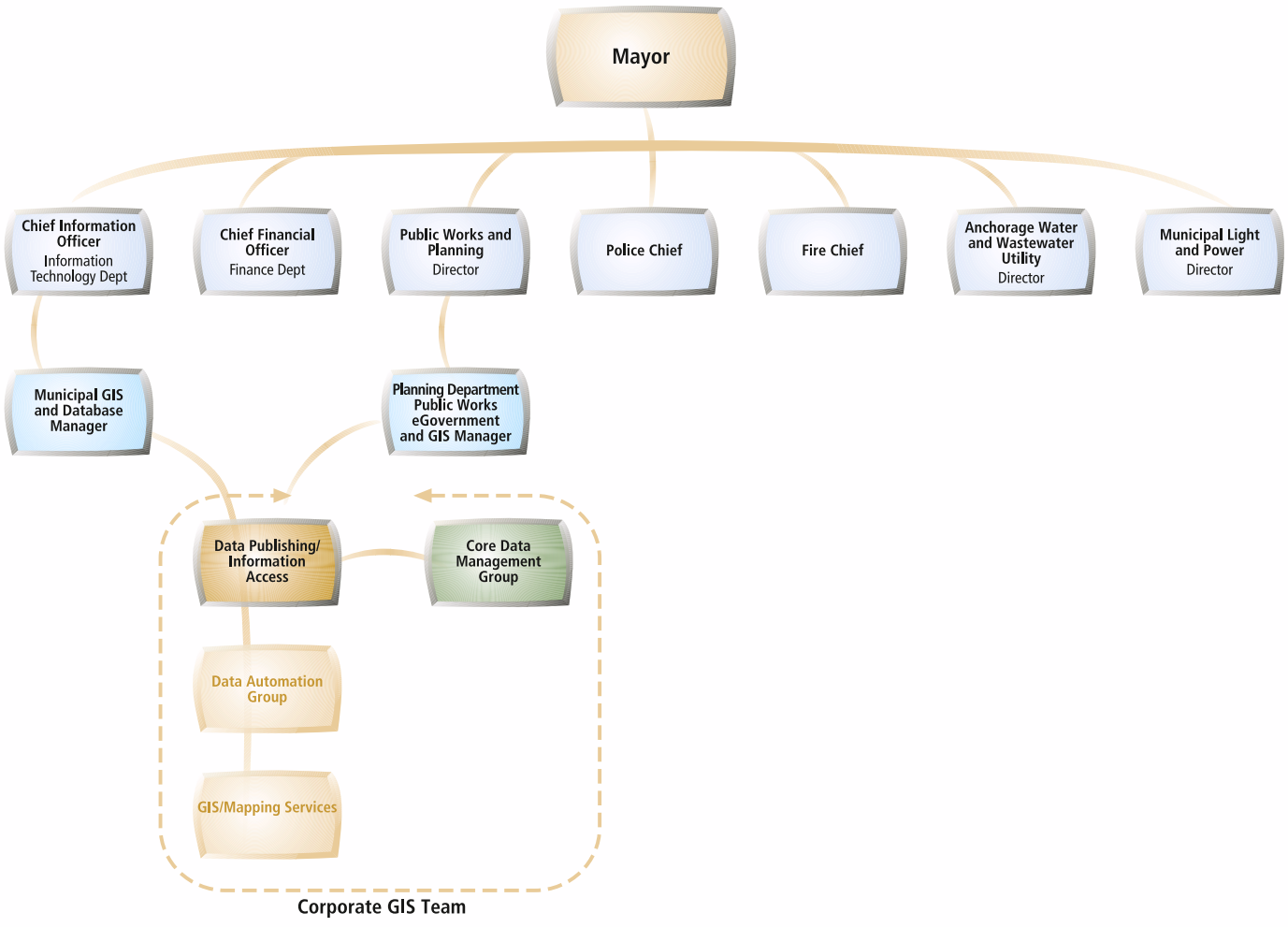
Major corporate GIS "customers" include Anchorage Water and Wastewater Utility, the Planning and Public Works Department, the Finance Department, the Fire Department, and the Police Department. Other "secondary" customers include the Transportation Department, Health and Human Services, and Municipal Light and Power. Federal departments working with MOA include the U.S. Geological Survey, the Bureau of Land Management, and the National Park Service. State-level participants include the state departments of Natural Resources and Environmental Conservation. Other partners include the Alaska Conservation Alliance, Alaska Pacific University, and the University of Alaska–Anchorage. Many joint projects with these various agencies foster the concept that GIS can integrate information about a community.

The public can access some of the data through the municipal Web site, www.muni.org, as well as via the FGDC Clearinghouse network, www.fgdc.gov. Through these sites, the public can access mapping applications, metadata, and other information about municipal GIS. Corporate GIS is currently working on an application to allow the public greater access to data and be able to download data in open GIS formats for specific areas of interest within the municipality.

Municipality of Anchorage, Alaska
Showing Corporate GIS and Major GIS Stakeholder



CASE STUDY

Anchorage, Alaska

ABOUT ANCHORAGE, ALASKA

Founded in 1915 as the hub for the new Alaska Railroad, Anchorage was incorporated as a city in 1920. As Alaska's largest city and the 68th most populous among U.S. cities, Anchorage is the hub of the state's communication, transportation, health care, finance, and trade industries, supporting a vital business sector. The oil and gas industry is the dominant economic mainstay for Alaska, and Anchorage is home to major corporate offices of British Petroleum, Phillips Petroleum, and others. There are more than 80,000 Real Property parcels within the Municipality of Anchorage that cover more than 1,900 square miles of land.

System Design

ESRI software and extensions

- **ArcView 8.x and 3.x** — 50 users throughout the municipality
- **ArcGIS (ArcInfo 8.x)** — 12
- **ArcEditor** — 2 (currently at AWWU)
- **Spatial Analyst Extension** — 1
- **3D Analyst Extension** — 2
- **Image Analysis Extension** — 1
- **ArcInfo 7** — 15
- **ArcSDE** — 2 active users/managers
- **ArcIMS** — 3 developers. 2 servers. Enterprise and public use of the applications.
- **ArcPad** — 1 developer, 3 users
- **MapObjects 2.1** — 1 developer
- **ArcExplorer** — 30

DBMS:	Microsoft SQL Server 2000 (used with ArcSDE); Oracle9i (used with ArcSDE); IBM DB2.
Operating System:	UNIX (AIX, Solaris); Windows 2000.
ArcSDE Server:	IBM xSeries with dual 1 GHz processor, 384 MB RAM, 55 GB SAN connected storage.
ArcIMS Server:	Compaq Proliant DL360, dual 1.266 GHz processors, 2 GB RAM, 72.8 GB disk.
Server Configuration:	Distributed network supporting a wide area network.
Number of Layers:	Eight core or framework layers; 15 essential layers; and nearly 50 ancillary layers.
Type of Data:	Core data includes parcels, subdivisions, elevation, orthoimagery, land use, streams, road network, and addressing. These are currently ArcInfo coverages (some are currently being migrated to geodatabases), IKONOS satellite imagery, orthoaerial imagery, shapefiles, and relational databases.
Size of Database:	20 GB in the corporate repository.