

Portland, Oregon

Goals

- Develop a comprehensive system for managing, maintaining, and sharing geographic data.
- Increase efficiency by eliminating redundant data and effort related to data maintenance.
- Standardize on a single software platform.
- Increase value of services provided to citizens by enabling one-stop access to citywide data.
- Provide city staff easy access to critical business data via enterprise solutions.

Results

- Developed the ability to support mission-critical operations and make better informed decisions
- Large cost-savings over nonenterprise approach in the millions of dollars
- Provides city staff and public with fast, easy access to information via a single source
- Laid the groundwork for successful data sharing with external agencies and business partners

Introduction

The people running Portland, Oregon, must be doing something right. During the past several years, this city, at the junction of the Columbia and Willamette Rivers, has been singled out by magazines and other news organizations in a number of categories.

CNN and Money and Outside magazines all recently named Portland one of the best places to live in the United States. It is also a nice place to visit; CNN, Money, and Travel & Leisure rated it among the top 10 places to vacation.

Meanwhile, Walking magazine rated it as one of the nation's top cities for walking. Throughout the 1990s, Bicycling magazine consistently rated the city among the nation's most "bicycle-friendly." In 2001, it received the magazine's top honor, being named the best city in North America to ride a bike. All of this walking and biking must have been part of the reason that Fit magazine called it "FitTown, USA," Men's Fitness rated it one of the Top Ten Fittest Cities, and Health magazine named it one of America's Fittest Cities for Women.

The news media also cited Portland for its small business development efforts, employment opportunities, recycling program, cultural programs, and climate. The city government may not be able to take credit for the weather, but many of the city's other honors certainly can be credited to proactive planning. An important tool for planning and decision making in Oregon's largest city has been its citywide geographic information system (GIS).



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An Enterprise GIS is Born

As in many cities, GIS use by the City of Portland developed with diverse agencies, bureaus, and departments relying on a mix of software and information systems. Each department used its individual system to increase efficiency, but sharing data and applications across the enterprise was a near impossibility. The resultant redundancy prevented the City of Portland from realizing its business goals, leveraging its investment in data and technology, and controlling costs. Faced with these challenges the City of Portland conducted a business case to evaluate the merits of migrating to a single enterprise system for GIS. The results of the business case were profound. The study identified a potential net savings of \$9 million over five years by adopting an enterprise system. This cost saving, combined with the ability to provide faster, more accurate, and more efficient services to citizens, businesses, and other agencies compelled the city to take the first steps toward an enterprise approach.

The city's Corporate GIS group envisioned an enterprise system that would give both expert and casual users seamless access to mission-critical data in a variety of spatial and nonspatial formats. As a result, the city, working with information technology consultant Schlumberger Sema, engineered and developed the City of Portland Enterprise GIS Hub (EGH). A pilot project was developed to demonstrate the ability to share data across the enterprise. As a response to the problem of sharing data among a rich mix of GIS data formats, databases, software, and hardware, EGH makes the diversity of underlying systems transparent to the user and provides rapid, Web-based access to vital data across the enterprise.

EGH production environment further implements an enterprise approach by standardizing on the ESRI software platform. Standardized data models and data maintenance applications were engineered and developed to meet the business needs of the city's diverse groups of data maintenance activities, legacy applications, and business processes.

Users have access to the full suite of ESRI software products via an enterprise license agreement with ESRI. The city has standardized on the ArcGIS plat-

form to deliver out-of-the-box GIS functionality. The Corporate GIS group has also heavily leveraged the ArcObjects development environment to implement solutions from basic customization and productivity tools to large-scale custom applications for enterprise data maintenance.

The Corporate GIS group has also created Web-based mapping and information services to allow staff access to key business information such as assessor data, zoning and regulatory data sets, utility infrastructure, crime data, and aerial photography.

Crucial to the successful transition to the Enterprise GIS Hub was the creation of an education program to give city staff the proper training to ensure success. In the time frame leading up to the implementation of EGH, the city worked closely with ESRI to provide more than 200 course seats of training to city staff. The city also has an ESRI authorized instructor on staff to continue to meet ongoing training needs.

Organization

The Corporate GIS group is made up of 10 dedicated employees within the Bureau of Information Technology. The CGIS mission is to

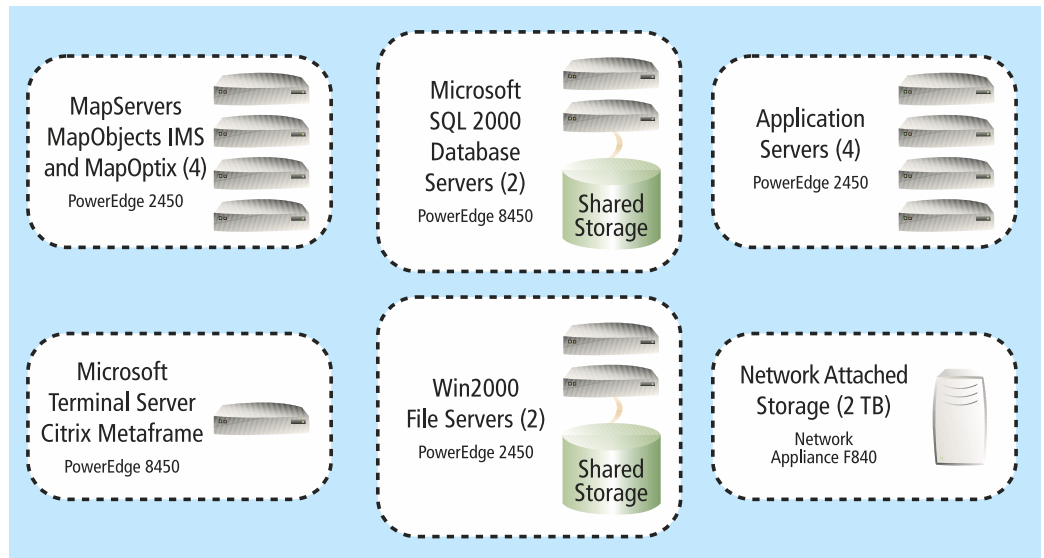
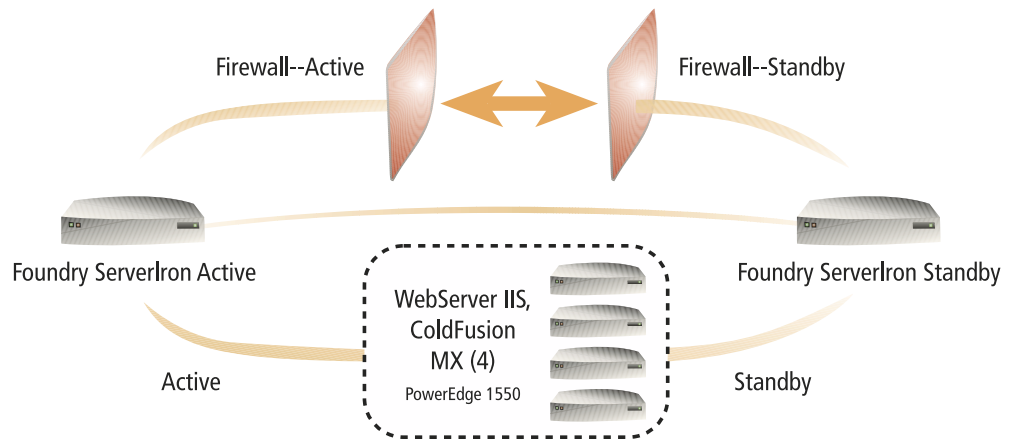
- Provide leadership and policy direction for the use of GIS and related technologies at the City of Portland.
- Be responsible for the development and maintenance of the Enterprise GIS Hub.
- Provide application development services to city bureaus and staff.
- Coordinate multiparticipant GIS efforts across the city and the region.

At the City of Portland, enterprise GIS has been achieved through the development of EGH. EGH is an entire framework of technical systems, standards, policies, and procedures to facilitate the development and use of GIS tools and information across all of the functional bureaus at the City of Portland.

In addition to the Corporate GIS group, several other city agencies meet a variety of diverse business needs with GIS software. The Bureau of Environmental Services is currently deploying a customized application for maintaining the sanitary sewer infrastructure and

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Corporate GIS Enterprise GIS Hub Network Diagrams



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maintains detailed models for watershed function and storm event monitoring purposes. The Bureau of Emergency Communication has implemented a Corporate GIS-developed, ESRI-based solution to provide real-time mapping of emergency calls and incident response. Working with the Portland Police Bureau, the Corporate GIS group created CrimeMapper, an Internet application to aid in community policing by mapping crime occurrences.

Other agencies using or developing GIS applications for more efficient government include the Water Bureau, the Bureau of Planning, the Office of Transportation, the Portland Development Commission, the Parks Bureau, and the Fire Bureau, among others. In addition, the city has data sharing agreements in place with Multnomah, Clackamas, and Washington Counties as well as the regional governing body, METRO.

The City of Portland provides public access to many sources of spatial and other information online.

- Portland Maps, www.portlandmaps.com, provides a variety of maps and spatial data including assessor/tax lot information, aerial photography, elevation, schools, parks, zoning, water and sewer, and natural hazards.
- Housing Connections, www.housingconnections.org, is a Web-based community service that is intended to better connect providers of housing and housing services to renters who are looking for these types of housing opportunities.
- www.carpoolmatchnw.org is an easy and convenient way to find someone to share a ride in Oregon and southwest Washington.
- <http://www.portlandpolicebureau.com/crimemapper.html>, allows a user to view crime maps of Portland as well as detailed graphs and reports that display crime data by month, day of week, and time of day.

System Design

ESRI software and extensions

- ArcGIS 8.2 -ArcView 8.2--90 users
- ArcEditor 8.2--20 users
- ArcInfo 8.2--30 users
- ArcSDE 8.2
- ArcView 3.2 -100 users
- MapObjects IMS 2.0

- DBMS:** MS SQL Server 2000
- Operating System:** Windows 2000 Server
- Server Configuration:** *Database Server*
(2) Dell PowerEdge 8450s with (8) 550 MHz processors and 2 GB RAM, Network Appliance NAS with 2 TB data storage
- WebServer*
(4) Dell PowerEdge 1550s with single 1.2 GHz processors and 2 GB RAM
- MapServer*
(4) Dell PowerEdge 2450s with (2) 1.2 GHz processors and 1 GB RAM
- MS Terminal Server--Dell PowerEdge 8450 with (8) 550 MHz processors and 4 GB RAM
- Application Server*
(4) Dell PowerEdge 6350s with (4) 550 MHz processors and 2 GB RAM
- Number of Layers:** 200 layers stored in geodatabase and shapefile formats
- Type of Data:** Various city bureau partners maintain the data sets that are warehoused in EGH. These include cadastre, transportation, water delivery network, sewer delivery network, zoning and land use, photogrammetric data, natural resource data, and digital imagery.
- Size of Database:** Vector—2.0 GB
Raster—150 GB