

## GIS: CATALYST FOR EGOVERNMENT DEVELOPMENT

If there is one single Web-enabled function that defines the leading edge of government implementation, it is the presence of online GIS applications.

The **City and County of Huntington, Indiana** (population 38,000), use a time-saving approach to inform residents of street repairs. Officials access an online geographic information system (GIS) program that displays a map of their jurisdiction. With a simple move of the mouse, they circle the affected area, and presto! A list of home and business owners is generated.

Using similar technology, **Fond du Lac County, Wisconsin** (pop. 42,000), offers the public a range of information from its Web site. Web-enabled access to zoning and property assessment information saves staff time and energy. "Without the Web site," according to the county's Web administrator, "county staff would receive an additional 85 calls per day."

### The Power of Online GIS

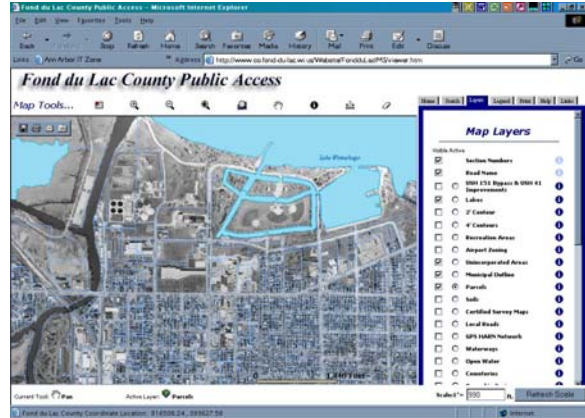
GIS refers to a variety of computer-based systems that manage, manipulate, and analyze geographically-referenced data. Local governments have used GIS for years to manage and update property information, emergency operations, infrastructure, and environmental resources.

Online GIS refers to the relatively recent effort to make these powerful tools available to the public via the Internet. There are a variety of computer hardware and software applications that make online GIS possible. The common feature among online GIS systems is the availability of publicly accessible interactive maps and data provided by local governments.

With the capacity to present information to constituents in new and exciting ways, Web-based GIS is often the most tangible and visible facet of egovernment (i.e., the use of technology to change how local governments provide services and conduct business). In many cases, GIS is the most sophisticated and most utilized online service.

Local government officials are realizing that Web-based GIS can ease the burden on staff, better disseminate location-based information, increase satisfaction in service provision, and play a role in economic development.

In a new era of fiscal austerity, some municipal governments consider government initiatives to be unnecessary. Many governments are focusing their resources on mission-critical functions and "essential" services such as police, fire, and public works. Despite these economically trying times, however, governments do not need to curb egovernment progress. The tools for egovernment are more widely available and fiscally attainable than many may think.



Utilizing its Web-based GIS, Fond du Lac County, Wisconsin, provides online access to parcel information and aerial photos, saving its staff and constituents time and energy.



## Online GIS as a Centerpiece for Local Governments

Encouragingly, many local governments are finding ways to leverage existing or planned investments in GIS to bolster enterprise-wide egovernment efforts. Studies show that municipalities that have invested in Web-enabled GIS tend to be positioned on the “leading edge” of government implementation.

Many municipal and county governments have not fully explored the power of Web-based GIS. Among those that have invested in GIS equipment, software, and staff for internal business functions, many have not made these services available via a publicly accessible Web site. To do so, however, is relatively cost effective and provides a host of benefits that will be further described in this white paper series.

This paper is the first in a series to explore the capabilities and benefits of GIS as the centerpiece of local egovernment. Future articles will address how GIS can provide:

- Immediate value at a relatively low cost
- High utilization and therefore increased constituent outreach
- Increased demand for and interest in other online services
- Potential for revenue generation
- An opportunity to lead the way for organizational changes

### **The challenge: how can existing and future GIS functions serve as a catalyst for enterprise-wide egovernment efforts?**

#### **What Can You Do with Web-based GIS?**

Many local governments have experienced the increased functionality and efficiency gained by incorporating GIS into their internal operations. Proliferating technologies that reduce costs have led to an increased number of local governments that provide online services to the public.

Online GIS services have been seen as an intrinsic public good, as they enable the provision of timely, accurate information. At the same time, Web-based GIS can reduce staff workloads, create new efficiencies (e.g., reduced mailing and administrative costs and increased opportunities for self-service information), and generate new revenues (e.g., data sales and licensing).

Online GIS services are useful to a range of local stakeholders, including citizens, developers, and real estate professionals. Some local governments use GIS to improve service delivery. Online functions allow people to access information without having to make a trip to a local government office or a phone call to a staff member.

Some examples of the benefits of Web-based GIS:

#### **Communicating Information**

Online GIS is a vehicle for communicating to residents the services provided and where they can be attained.

- The **City of Clovis, California** (pop. 70,000), Web-based GIS provides basic information on political divisions, such as municipal boundaries and school,



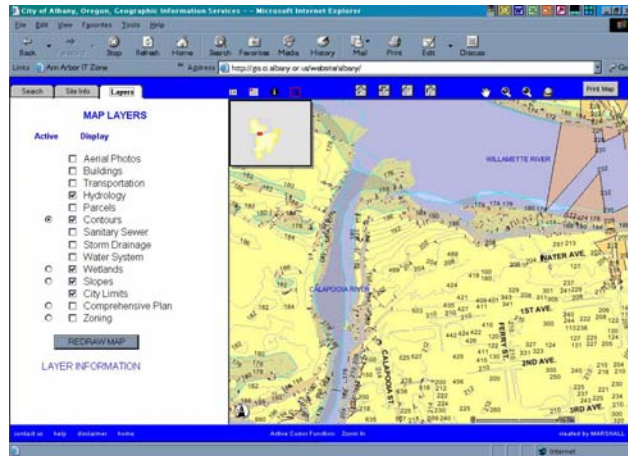
legislative, and voting districts. Such information is useful to constituents who are interested in learning about important voting, parking, and police information.

- The **Town of Concord, Massachusetts** (pop. 17,000), online GIS is among many that offer information on planning and zoning designations, such as specific parcel information, environmentally sensitive areas, and historical districts.
- The **City of Marietta, Georgia** (58,000), online GIS provides information on public facilities, such as recreation areas and municipal facilities.

### Improving Services

From emergency management to environmental/land use to telecommunications planning, Web-based GIS can assist staff in improving service delivery to a variety of constituents.

- Emergency planners in **Clay County, Minnesota** (52,000), can determine emergency routes, snow removal routes, and emergency response districts by accessing infrastructure information, such as the location of streets, sewers, and fire hydrants, thereby saving time for call-center staff and improving public safety.
- The **City of Albany, Oregon** (pop. 41,000), Web site offers information on physical features, such as local hydrology and topography, and information on sensitive environmental areas, such as wetlands and steep slopes. Easily accessible, online information of this type assists developers and builders.
- The **City of Idaho Falls, Idaho** (pop. 51,000), online GIS provides mapped locations of the community's fiber-optic cable within the city as well as related available services.



The City of Albany, Oregon, provides a variety of information related to physical features of use to developers, engineers, and those concerned with sensitive environmental zones.

### Tracking Property

- Online GIS provides public access to property information, such as tax parcels and assessments.

- The **Chatham County, North Carolina** (pop. 50,000), Tax Parcel Information System integrates GIS into a property database and allows site visitors to easily identify parcels. Public information on the property is displayed with aerial photographs.
- **Greenwood County, South Carolina** (66,000), provides tax and assessment information on comparable and abutting properties through a GIS-based parcel database.
- The **Town of Westborough, Massachusetts** (pop. 14,000), online GIS includes the shapes of buildings (i.e., “footprints”) in addition to property boundaries providing a full picture of current land use.

Chatham County, North Carolina, like many local governments, allows interactive access to property information via its Web-based GIS. This feature saves time and effort for property owners, developers, and county staff.

### GIS at the Leading Edge of eGovernment

Results from the International City/County Management Association (ICMA) 2002 Electronic Government Survey<sup>1</sup> suggest that a majority (63.4%) of jurisdictions utilize GIS. To date, only a small minority (17.2%) of those surveyed by ICMA provides Web-based GIS. Other surveys show that municipalities that are at the forefront of government development generally have implemented at least minimal online GIS.

There are many ways to measure the progress of egovernment. It is increasingly the case, however, that the highest returns on egovernment investment are made via Web-delivered functions. One effort at providing a reliable benchmark is the Municipality eGovernment Assessment Project, or MeGAP,<sup>2</sup> which ranks municipalities on the basis

<sup>1</sup>ICMA compiled results from more than 4,100 cities and counties responding (52.6%) to the survey, which covered e-government services, financing, and management; online procurement; GIS; and use of intranets.

Aggregate results of the survey are available on ICMA’s Web site at <http://icma.org/go.cfm?cid=4&gid=20&sid=41>. Complete survey results, downloadable for analysis, are available through the ICMA bookstore at <http://bookstore.icma.org> in the E-Documents section.

<sup>2</sup> The Public Sphere Information (PSI) Group (<http://www.psigroup.biz>) developed and maintains the Municipality eGovernment Assessment Project (MeGAP) as a means to provide timely best practices information to local governments. The MeGAP evaluates the degree of implementation across 55 different functional performance dimensions that correspond to the delivery of specific municipal services (such as online information delivery, online permitting, licensing and registration, online transactions, and e-democracy). An analysis of the largest cities in the U.S. (over 100,000) is performed annually, and several regional and statewide assessments have also been conducted.

Summary results, explanations of the methodology, and several reports from these assessments are available from the PSI Group Web site at <http://www.psigroup.biz/megap>.



## Analyzing GIS and e-Government

The Municipality eGovernment Assessment Project (MeGAP) assesses 55 different features common to municipal Web sites in several categories:

- **Information Dissemination**
- **Interactive Functions (including online GIS)**
- **eCommerce Functions**
- **eDemocracy**

The MeGAP shows that most national e-government leaders (including all of the top 30) have online GIS functionality:

- 43% of U.S. cities over 100,000 have at least basic online GIS function
- 26% of these larger U.S. cities have interactive online GIS servers

of online implementation of functions and services that were previously performed offline.

Recent MeGAP data show that the largest cities with successful e-government have focused on a finite set of functions—information dissemination, document management, permitting and licensing, and online GIS. A majority of cities at the leading edge of e-government have implemented basic GIS applications online.

The national MeGAP study focuses primarily on larger U.S. cities, which tend to have more resources dedicated to e-government implementation. That said, the number of smaller jurisdictions that are joining the ranks of the leading edge is growing. For example, in the St. Louis, Missouri, region, the overall leader in e-government implementation according to the MeGAP functional assessment is **St. Peters** (population 51,000). Other regional leaders according to the MeGAP include

**Maryland Heights** (pop. 26,000), **Kirkwood** (pop. 27,000), and, not surprisingly, the **City of St. Louis** itself.

The MeGAP shows that since 2001, many smaller jurisdictions are catching up with early leaders in e-government. As recently as 2000, only about a quarter of MeGAP cities with populations between 100,000 and 200,000 had official sites; today, all of them do. This growth of e-government holds true for smaller jurisdictions as well. Part of this trend is certainly due to decreasing technology and development costs, after the initial pioneering efforts of early innovators.

Although MeGAP cities have made impressive advances, data suggest room for improvement. For example, 26% of cities surveyed in the MeGAP have interactive Web-based GIS servers. Anecdotal information suggests that many local governments are using GIS within their organizations and have plans to launch Web-based mapping features. Additionally, many cities and towns are accumulating geographic data for future integration into either enterprise-wide intranet GIS functions or publicly accessible Web-based servers.

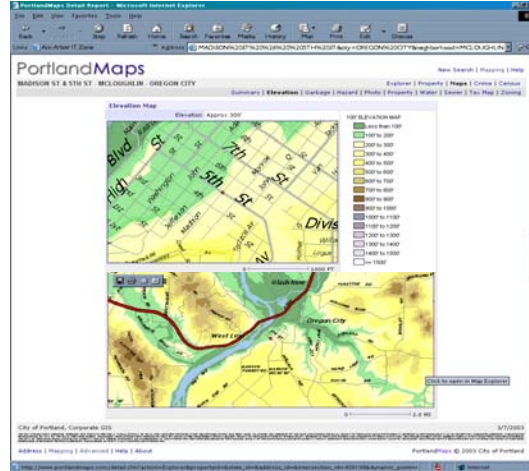
### GIS: Breaking Down Barriers

The key to effective online GIS is to provide a single point of entry—simple access to complex information and technology. The user identifies a place or a service, and all of the various datasets and applications work behind the scenes.

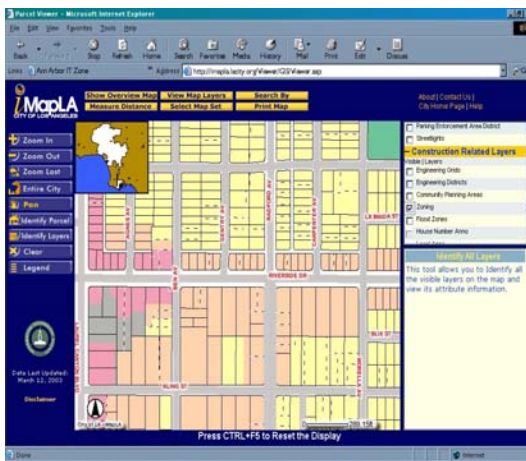


The key to a single point of entry is to coordinate the GIS functions and datasets of each department. This is called enterprise GIS, in which a single system works across many departments. This effort requires enterprise-wide changes: a new focus on service delivery via technology, information sharing across departments, and standardization of procedures. All of these changes are also at the heart of government. In many cases, Web-based GIS—especially the information and data sharing necessary to make it a success—is the first step in broader organizational change.

- The **City of Portland, Oregon**, Corporate GIS coordinates the various departmental uses of GIS into an enterprise-wide approach. According to the city's Web site, the Corporate GIS Team "has been working to bridge the gaps between the systems and make data sharing and City-wide application development a reality." This effort also means that the city can create efficiencies by reducing redundancies in data collection and maintenance. Portland's GIS is leading the way for other organizational efforts toward government.



The Portland, Oregon, Corporate GIS system represents an enterprise-wide approach to providing information. The city's Web-based GIS exemplifies the organizational changes that are at the heart of government.



ImapLA provides easy access to information from multiple city departments.

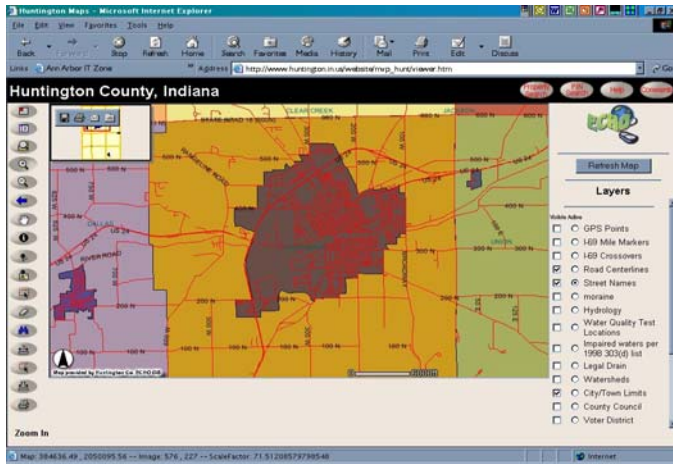
- The **City of Los Angeles, California**, Web-based GIS offers several innovative features, such as real-time traffic maps (<http://trafficinfo.lacity.org/>). The city's online data viewer, iMapLA, allows Web site visitors to see location-specific information (e.g., parcel, public safety, services, streets, construction projects, and economic development projects). Another innovative feature, "My Neighborhood," enables site visitors to customize access to a host of location-specific data. All of these services are provided from a single "Interactive City Maps" page, speaking to high-level data

standardization and sharing. This citywide effort at providing information to the public without reference to the departments from which the services and data are originating is typical of leading-edge government. The new mode of service delivery, in this case demonstrated by GIS, shows how the comprehensive

provision of the city's information transforms the manner in which the city conducts business.

### What about Smaller Localities?

Smaller communities often have fewer resources than their high-population counterparts. However, small communities have relatively simpler business operations; therefore, modifying operating procedures, such as process flow across departments, is far easier. And, smaller local governments may also find it easier to integrate and assemble their data. Smaller communities are already innovators in egovernment and



The County and City of Huntington, Indiana, Web site offers an online ArcIMS server, typical of much larger communities. This functionality, which offers visitors interactive access to natural and physical features as well as political boundaries, is becoming increasingly common among smaller jurisdictions.

online GIS—most of the examples in this document are from communities with populations under 60,000. Through creative thinking, collaboration across jurisdictions, grant development, and other innovative means, smaller communities are defining a new aspect of egovernment, changing the way business as usual is conducted.

Regardless of size, governments can judiciously invest in resources, encourage collaboration across departments, and think strategically to improve internal and external business operations.

### GIS: High Value for Relatively Low Cost—The Next Topic

As this article suggests, there are compelling reasons—budgetary realities notwithstanding—for beginning or continuing to use GIS as a centerpiece of egovernment efforts. Look for our next discussion on financing Web GIS, a relatively inexpensive undertaking that has tremendous potential for providing immediate business value.

### **Online Resources:**

- City of Albany, Oregon, GIS, <http://www.ci.albany.or.us/pages/gis/gis.html>
- Chatham County, North Carolina, Tax Parcel Information System, <http://maps.terraverge.com/chatham/>
- Clay County, Minnesota, GIS, <http://www.co.clay.mn.us/Depts/GIS/GISMapOL.htm>
- City of Clovis, California, GIS, <http://www.ci.clovis.ca.us/UMAP.asp?ID=393&FolderID=162&CurrentNode=162>
- Town of Concord, Massachusetts, WebGIS, <http://gis.concordnet.org/concord/>
- Fond-du-Lac County, Wisconsin, GIS, <http://www.co.fond-du-lac.wi.us/Website/FondduLacIMS/viewer.htm>
- Greenwood County, South Carolina, GIS, <http://165.166.39.5/website/gis/viewer.htm>
- City and County of Huntington, Indiana, GIS, <http://www.huntington.in.us/gis/>
- City of Kirkwood, Missouri, GIS, <http://www.kirkwoodmo.org/mapspage.htm>
- City of Idaho Falls, Idaho, Online Maps, [http://www.ci.idaho-falls.id.us/website.nsf/\(ByDocID\)/191D7EC2C30DBA5B87256CD2007926A0?OpenDocument](http://www.ci.idaho-falls.id.us/website.nsf/(ByDocID)/191D7EC2C30DBA5B87256CD2007926A0?OpenDocument)
- City of Los Angeles, California, iMapLA, <http://imapla.lacity.org/Viewer/GIS/Viewer.asp>
- City of Los Angeles, California, Traffic Information, <http://trafficinfo.lacity.org>
- City of Marietta, Georgia, GIS, <http://www.city.marietta.ga.us/GIS/maps.htm>
- City of Maryland Heights, Missouri, <http://www.marylandheights.com/index.asp?ID=23>
- City of Portland, Oregon, Corporate GIS, <http://www.cgis.ci.portland.or.us/main.cfm>
- City of St. Louis, Missouri, <http://stlouis.missouri.org/>
- City of St. Peters, Missouri, <http://www.stpetersmo.net/default.asp?Dept=42&AID=10601>
- Town of Westborough, Massachusetts, GIS, <http://gis.virtualtownhall.net/Westborough/>

This paper was authored by Charles Kaylor of the PSI Group and Mike Freeman of HDR's Management Consulting, an ICMA Corporate Partner, in conjunction with ICMA's Technology Management Institute and GIS Program.

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### HDR Management Consulting

HDR's Management Consulting Group advises top municipal officials on issues of strategy, organization, finance, technology, and operations. Our consultants work collaboratively with local government officials to develop and implement solutions to challenging problems. HDR takes a rigorous, fact-based approach to consulting, focusing on those issues that are of most important to address to produce meaningful results. HDR has more than 70 offices in the U.S.

### Public Sphere Information Group

The PSI Group provides vital information, strategic and business planning, and other services to organizations engaged in the public sphere—governments, non-governmental organizations, and businesses alike. The PSI Group works with communities to harness the latest developments in technology to change the way they provide services, share information, and transform interactions. As a means to provide targeted, strategic, and timely information to local governments, the PSI Group developed and maintains the Municipality eGovernment Assessment Project (MeGAP).



### About ICMA

Founded in 1914, the International City/County Management Association (ICMA) is the professional and educational organization for 8,000 appointed administrators and managers serving cities, counties, other local governments, and regional entities worldwide. The ICMA mission is "to create excellence in local governance by developing and fostering professional local government management worldwide."

### ICMA Technology Management Institute

The Technology Management Institute (TMI) establishes a network of local government executives working to understand relationships between technology and management. It serves as a clearinghouse for news, strategies, policies, and best practices and provides training and professional development opportunities. TMI fosters partnerships that work to promote excellence in governance to build stronger communities in a networked world.

### ICMA GIS Program

ICMA's GIS program connects local government executives with peers, state officials, federal agencies, and the private sector. ICMA promotes GIS to improve internal business operations and external service delivery, conducts research and disseminates information, and facilitates discussion around best practices and trends in GIS management.

### ICMA Corporate Partnership Program

ICMA partners with public and private sector organizations, like HDR Management Consulting, and policy makers at the local, state, and federal levels to enhance local government efficiency and innovation and to introduce new resources into community services. ICMA's partnerships reflect the association's commitment to drawing on available resources in various sectors to support successful local government programs and practices.

