

Arlington County, Virginia, Implements Fully Integrated Web-GIS Solution

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The GIS Mapping Center Bureau, Arlington County, Virginia, is a leader in the growing number of jurisdictions taking advantage of the flexible integration capabilities of today's web based GIS solutions. Web-GIS allows the County to put collected spatial and non-spatial data to work in the hands of the community and in the hands of agency clients. In 2003 the GIS Mapping Center Bureau tested and began implementation of an ESRI compatible web program. Since the summer of 2005, staff has been managing two web solutions, one running on the Internet and the other on the Intranet.

For Arlington County, a small, densely populated urban jurisdiction located directly across the Potomac River from Washington, D. C., the challenge was to serve out GIS databases through a single web-based front end. It had to have a simple, intuitive, and easy-to-use interface allowing dissemination of GIS data over the Internet and Intranet, optimizing cost effectiveness over desktop applications, and providing tools to economically develop applications with the same look and feel as the query interface.

When searching for a solution to accomplish these ambitious requirements, Arlington County was able to draw on its long history with GIS solutions. In 1993, the County established a dedicated GIS Mapping Center to manage all maps and geospatial data, and this Center gradually built an infrastructure to accommodate the data. As the program grew, however, various custom-built data management applications became unwieldy and difficult to use, not to mention non-Y2K-compliant. These applications were also cumbersome and complex to learn and manage. By 1999, the Mapping Center had adopted a strategy that focused more on web-based GIS solutions.

With only two technical positions to support system and applications work, the Mapping Center must be able to upgrade quickly to operating changes (either hardware or software); moreover, it was desired that staff be able to concentrate their efforts on learning the fine points of one unified package, not several different ones. Arlington County's choice of a web-based solution fit in perfectly with its enterprise-wide vision. The solution's server applications integrate multiple databases seamlessly into a single point of access. With this web approach, we reach the widest possible audience with minimal tech support, avoiding time consuming desktop installations.

Through the web-based portal, the Mapping Center administrators make data available to citizens in the form of interactive maps. Whether the user is a citizen interested in property data or a developer searching for zoning information, they use this intuitive front end to retrieve the information they require, displayed geographically. Currently, the Real Estate database (CAMA), Permits (Permits Plus) and the Utility Maintenance System (CASSWORKS) are linked to the web application, but they are managed and maintained outside the Mapping Center. (Since Arlington County considers the utility data proprietary, CassWorks is only available on the intranet).

Last year the Mapping Center worked closely with our Planning Research & Analysis Team (PRAT) from the Department of Community Planning, Housing & Development (DCPHD) and launched the Development Tracking Map Browser. This application was developed from the primary web-based tool kit to allow the public to select from a variety of projects in several stages (demolition, approved but not under construction, under construction, or complete), and view pertinent information about them. For instance, using a County base map the user can select a project location and learn the address, permit dates, GFA/Units, height, affordable units, and development type. In the past this information was accessible only to PRAT staff and when inquiries were made, significant staff time was necessary to produce the data. Now the information is available on demand to agency decision makers, the public and the business community without extensive research by the planning team. The information is updated quarterly by a simple geocoding process from a database maintained by PRAT. The application has proven popular for providing quick project snapshots to inquisitive taxpayers. Other benefits followed from the creation of this database including permit data analysis by neighborhood based on attributes such as year built, square footage, number of residential units and uses of the buildings.

Other business needs for PRAT grew out of concerns regarding residential infill development in some of Arlington County's older neighborhoods. When amendments to the zoning code were approved restricting allowable lot coverage in single family neighborhoods, Mapping Center staff used GIS analysis capabilities to determine lot coverage characteristics for every single family parcel in the County. (Lot coverage is the ratio of buildings and driveways to total lot area). This lot coverage database was then linked to the web-based GIS application and is viewed by Zoning staff when advising property owners on development options. It is also available on-line to citizens who want to check their own lot coverage information.

Another hallmark of this web solution is its versatility. An internal notification application is now in place that combines the functionality of Crystal Reports with our web application to create both a map and a form letter notifying property owners of impending zoning and variance changes. Since the County is required by law to notify adjacent land owners of public hearings for proposed density, land use or zoning changes, PRAT welcomed this addition to our application portfolio. Moreover, staffers report that this solution is easy to use and, based on the live link to the GIS geospatial parcel data as well as to CAMA, they know that the information is current.

Based on the success we've enjoyed with PRAT, other customers have come forward. For years the Real Estate Bureau had expressed interest in an automated File Tracking System so that their work files could be related geographically as well as referenced by type of agreement. To meet their needs, an electronic file system was set up on the Mapping Center's intranet linking project files to real property codes and real property map sheets. From their desktop staff are able to search geographically for files by type of project (fee acquisition, encroachment, temporary easement, vacation, lease, etc.), project name, address, client and status. In the process the physical location of the files is also made available. The application is still under development, but preliminary tests are very promising, showing the potential for significant time savings.

Under consideration for future applications are project management for Real Estate, County facilities management, vehicle tracking and real time support for the Emergency Operations Center to track street closings. Also on the drawing board are applications for the County's three utility networks, water, sanitary sewer and storm water. These initiatives will be evaluated and prioritized in terms of business need, client commitment and the availability of resources.

In terms of lessons learned, the Mapping Center has been satisfied with the "keep it simple" approach. Using a single front end for both interactive mapping and application development has paid off in terms of conserving system analyst time. It also has created a consistent look and feel to our web presence. Although our users seem genuinely happy with the viewing and query functions of our platform, we must point out that this is not a full function mapping solution. We encourage our internal users to request maps produced on the ArcGIS platform, taking advantage of our cartographers' mapping expertise and their access to high resolution plotters. Our services are fast and the end product is high quality. For the public we have a of variety pre-set standard products (both data and maps) available for sale.

One final lesson involves user support. Although the interactive mapping is intuitive, it has been our experience that a user guide is helpful, and for agency clients, training sessions have increased interest and use dramatically.

Arlington, Va., is a world –class residential, business and tourist location that was originally part of the "10 miles square" parcel of land surveyed in 1791 to be part of the Nation's Capital. It is the geographically smallest self-governing county in the United States, occupying slightly less than 26 square miles. Arlington maintains a rich variety of stable neighborhoods, quality schools and enlightened land use, and received the Environmental Protection Agency's highest award for "Smart Growth" in 2002. Home to some of the most influential organizations in the world – including the Pentagon – Arlington stands out as one of America's preeminent places to live, visit and do business.

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