



Thought Leadership from ESRI

Building a Server-Based GIS Public Works Information System

Public works departments have historically been at the forefront of geographic information system (GIS) adoption and innovation—using it to improve the capacity, efficiency, and cost-effectiveness of vital systems that serve the community. Unfunded mandates like GASB 34, growing populations, natural disasters, and threats to critical infrastructure have motivated public works departments to find new ways of implementing GIS solutions in the office and in the field. Server GIS technology, like ESRI® ArcGIS® Server, provides public works with an opportunity to advance spatial information systems to a new level of service and performance. With server GIS technology, public works departments can generate and manage geographically enabled Web services, also known as geoservices, which can be used by project managers, inspectors, engineers, and field crews in desktop computers and mobile devices.

“We understand public works and recognize the major role GIS plays in helping the industry improve workflows and provide citizen access to community information,” says Jack Dangermond, president of ESRI. “We see the unifying capacity of server GIS strengthening that role by extending GIS capability to every person in the organization and to every application and device.”

On a day-to-day basis, public works employees rely on a variety of systems to plan work, complete tasks, and update databases. They must engage with work order systems, asset management systems, permitting systems, 311 systems, complaint center systems, and so on—with each system offering a different array of interfaces and data. When GIS is integrated with these systems, geography becomes the focal point for service and data, linking databases together, consolidating workflows, and presenting a common operating picture for the end user. For example, a supervisor can quickly find the location of a site, access the work orders pertaining to the site, visualize the site in 3D, generate detailed maps, and spatially analyze the problem before scheduling and routing field crews.



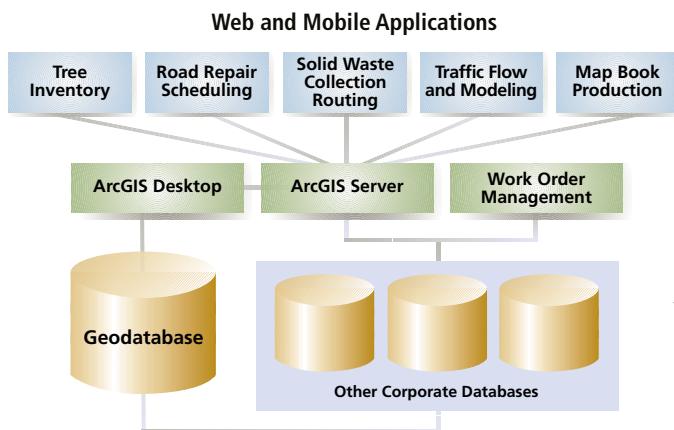
A public works information system utilizes GIS to bind programs and systems together to facilitate the flow of information. Public works and IT departments are motivated by different drivers, but GIS forms a seamless connection between them.

On-site inspectors and field crews can bring GIS with them on mobile devices, like Tablet PCs, to verify locations, double-check physical requirements, order additional resources, and collaborate with other departments and jurisdictions. Wireless connectivity, geoservices, and Web mapping applications allow the field crew to complete database transactions in near real time. Public works operations become more efficient, and users with no GIS experience gain access to previously unavailable data when GIS becomes the backbone of all information systems.

“I see public works departments building libraries of geoservices that can be used by project managers, engineers, and field crews in focused Web mapping applications,” Dangermond says. “ArcGIS Server is really a new platform for both end users and developers. It is a comprehensive server-based GIS.”

Using ArcGIS Server technology, public works departments can quickly publish geoservices from maps, globes, and geoprocessing models created on the desktop. They can also create Web mapping applications that consume these services, tailoring GIS capability to meet the specific needs of end users. Developers can generate applications for mobile devices or create custom browser-based applications.

GIS integration with other corporate systems leverages existing databases and legacy applications to create new, highly focused, online tools for public works users—on the desktop, in Web applications, or in mobile devices. This concept of an interoperable, discipline-specific information system has emerged thanks in large part to technologies like ArcGIS Server, ESRI’s complete, server-based GIS.



ArcGIS interoperability allows organizations to fuse systems, like a work order management system, and other enterprise databases with ArcGIS technology and create Web and mobile applications that work in the office and in the field.

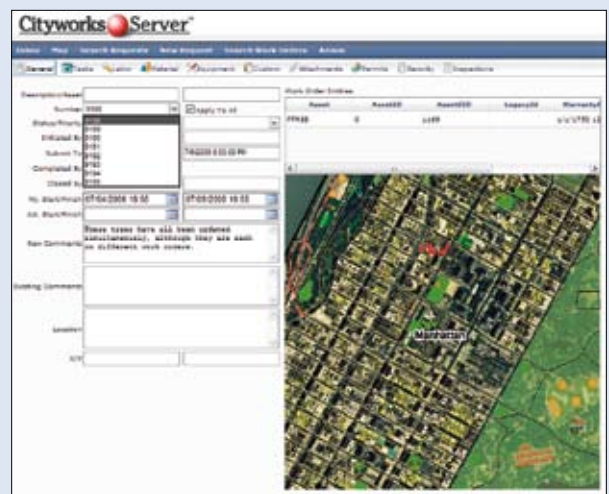
Through a rigorous scope of work and problem definition process, the city decided to implement a browser-based Forest Management System (ForMS) built within a .NET 2 architecture based on ESRI's ArcGIS Server 9.2 and Azteca Systems Cityworks, with additional support from Bowne AE&T Group and Camp Dresser & McKee (CDM). The key system requirements included centrally managed servers, a GIS-based tree inventory, and a work order management system that operates directly on the GIS-based asset inventory. A critical element in the design was the seamless integration with the city 311 system, which serves as a single point of contact that kicks off a complex series of data transactions starting with a service request call. The call passes through a series of management layers and is delivered to the appropriate field crew for subsequent resolution.

ForMS includes many distinctive capabilities above and beyond the core requirements of a GIS-based work order management system. The system supports the full range of key business processes for work orders, inspections, and service requests in a security-enabled environment. These capabilities, along with full map interaction, optimized tree inventory and maintenance history, and reporting functions, are available to system users. In addition, the user interface is designed so that the entire Web application, including screens, data forms, and data fields, is configurable with respect to display styles, layout and viewing and editing capabilities.

Other important functions include the ability for users to incorporate individualized reports, queries, map displays, and other Web parts into the user's inbox.

A flexible architecture design means users can place Web parts designed for ForMS on the page along with third-party plug-ins and many other common Web elements. This allows users to incorporate peripherally related data and information that are not core components of ForMS but are directly related to a particular user's job needs. Other system capabilities include a project manager with embedded contract management, permit management, seamless 311 integration (at the server level), and a large array of management reports.

Implementation of ForMS means that the New York City Parks and Recreation Department is prepared to move forward with an ambitious set of programs and objectives to help manage and maintain the city's urban forest.



New York City's ForMS is an easy-to-use Web application that ties together 311, a GIS-based tree inventory, and work orders and operates on a GIS-based asset inventory.

For more information on GIS for public works, visit our Web site at www.esri.com/publicworks/PW01.



Tel.: 909-793-2853
Toll Free: 1-800-447-9778
E-mail: info@esri.com
Web: www.esri.com