Implementing GIS on a Budget

A small Tennessee utility district addresses network needs with GIS software

Small water utilities face the same operational challenges, regulations and requirements as large ones but make do with fewer resources. Efficient operations are therefore essential to their ability to offer high-quality, reasonably priced water services. These days, efficient operations depend on support from robust data and data management systems.

By Susan Harp

"Small utilities have all the big-city needs to have access to accurate information but don't have the same financial resources to build and maintain it," said Andrew Koostra, information systems manager for Consolidated Utility District (CUD) of Murfreesboro, Tenn. The CUD's team of about 100 employees serves approximately 46,000 water meters in central Tennessee's Rutherford County.

CUD solved its need for an accurate picture of its utility network—as well as an efficient way to maintain, assess and share network information with its other business systems—by implementing GIS software technology made by ESRI, based in Redlands, Calif.

GIS integrates data, computer hardware and software designed for spatial data to capture, manage, analyze and display information according to location. For example, it can display the assets of a water distribution system on a map. The GIS database includes location coordinates and processes that associate information with a physical location so that it can be viewed on a map or aerial photograph and analyzed using spatial concepts.

GIS can overlay and combine different kinds of information on a single map that summarizes and identifies, for example, customer locations, work orders and water utility assets. When GIS is integrated with business information, such as a work order management system and customer information system, maintenance personnel can use GIS to view the exact location of a pipe break, display upstream and downstream pipe maintenance records, calculate the minimum number of valves to close during repair work and extract a call list of affected customers.

Geographic Advantages

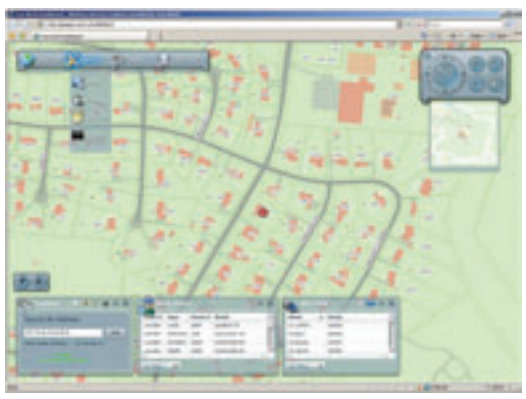
Five years ago, CUD converted from a CAD-based system for managing infrastructure to one built on ESRI GIS software. Today, the group has an enterprise GIS that gives access to spatial and business information across the organization, keeps track of fleet vehicles and supports wireless exchange of information with workers in the field.

"GIS has improved our data organization and made information held in different systems, such as customer information, accessible in one place," Koostra said. "Now, we can use ESRI's advanced analysis software to expand the benefits of our existing GIS." About 75% of CUD employees now use GIS, about 50 of whom work in the field.

"Moving from CAD to a GIS-based asset management system makes it possible to access and use company-wide information with one common platform," said Lori Armstrong, ESRI's global water/wastewater industry manager. "A main question for small utilities is whether they have the resources to operate efficiently and effectively, and the GIS platform assists in developing better-managed systems that require less time and money."

Getting Started with GIS

CUD built its GIS venture with assistance from True North Geographic Technologies (TNGEO), an ESRI-authorized



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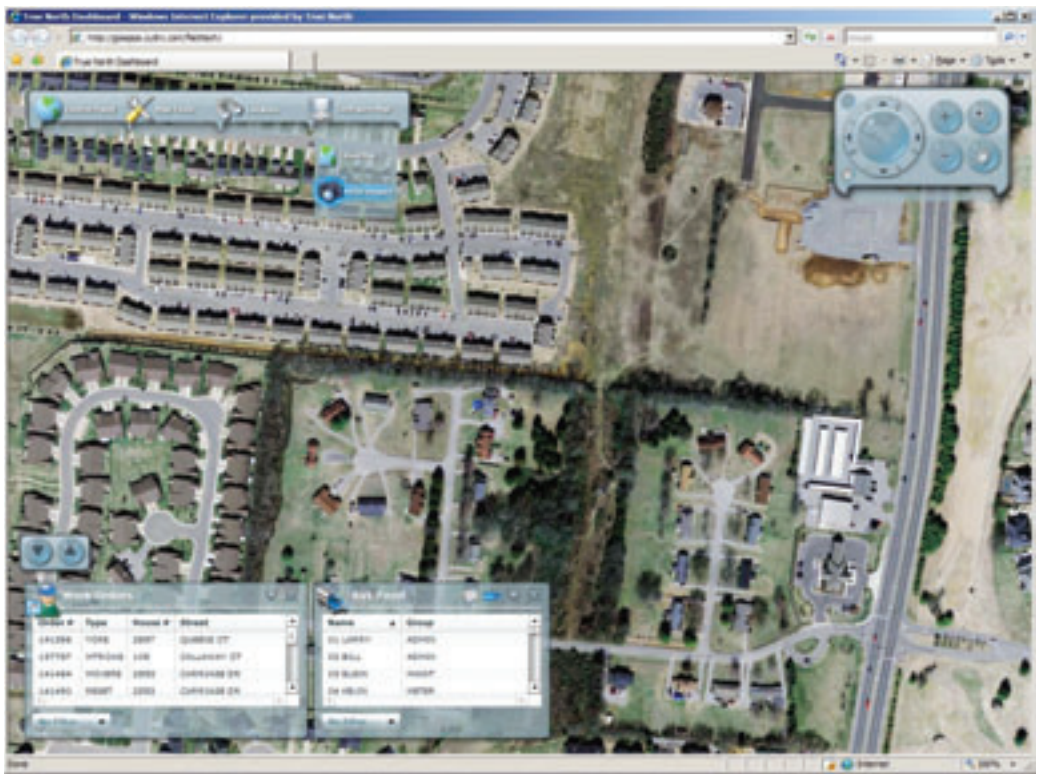

consultant located in Murfreesboro. The company provided geodatabase design, data migration and system architecture configuration services, which are important for establishing a good foundation. TNGEO developed custom database processes for integrating asset data in the GIS asset management system with existing business systems, such as SCADA and customer information, as well as one for real-time tracking of vehicles in the field.

TNGEO also developed a Web application to provide CUD field staff with wireless access to maps, work order information and vehicle locations through ruggedized Tablet PCs. The application uses ESRI server software (ArcGIS Server) to deliver digital work order assignments, maps and work report forms to field computers.

This application reaps three benefits. First, by delivering data and software wirelessly over the Internet, the complexity of managing data on Tablet PCs is reduced. Second, live GIS map services that can be frequently refreshed and centrally managed give field staff the most current maps. Last, the at-a-glance overview of work assignments and vehicles creates opportunities to improve work efficiencies.

Making It Affordable

CUD is currently leveraging its investment in GIS technology by participating in ESRI's Small Utility Enterprise License Agreement (SU-ELA) program, which offers access to a wide range of ESRI GIS software at reduced prices. SU-ELA specifically benefits small utilities, including electric, gas and water, by giving them an economical way to get started with or expand GIS. SU-ELA allows unlimited deployments of ESRI ArcGIS software throughout the organization.

"In today's economic environment, it is our desire to be as efficient as possible," said Larry McElroy, CUD general manager. "This will enable us to reach some of those goals. Our GIS system is growing, and we are glad to have unlimited software access for our staff."

Through the SU-ELA, CUD has access to the same software that larger utilities can afford, and the company can use it to develop new time-saving applications at a cost that fits a small utility budget. For example, ArcGIS Server Advanced supports Web-based spatial editing that allows staff to make edits to GIS data in the field and deliver the changes wirelessly to the main office. The software also enables dynamic modeling of network conditions and visualization and analysis of 3-D data.

"The SU-ELA program really does make it affordable for smaller utilities to license the ArcGIS Server technology, and with the application development options that are made available, we can quickly build custom applications that incorporate information from multiple business systems," said David Speight, president of TNGEO. "Utilities can save money on the core software and also on consulting services that may be needed for implementation and integration."

In addition to software access, SU-ELA includes product maintenance and support, staff training, access to ESRI data models, registration at the annual ESRI International User Conference and a simplified fee system that helps cut down on administrative costs. For more information on SU-ELA, visit www.esri.com/suela. WWD

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