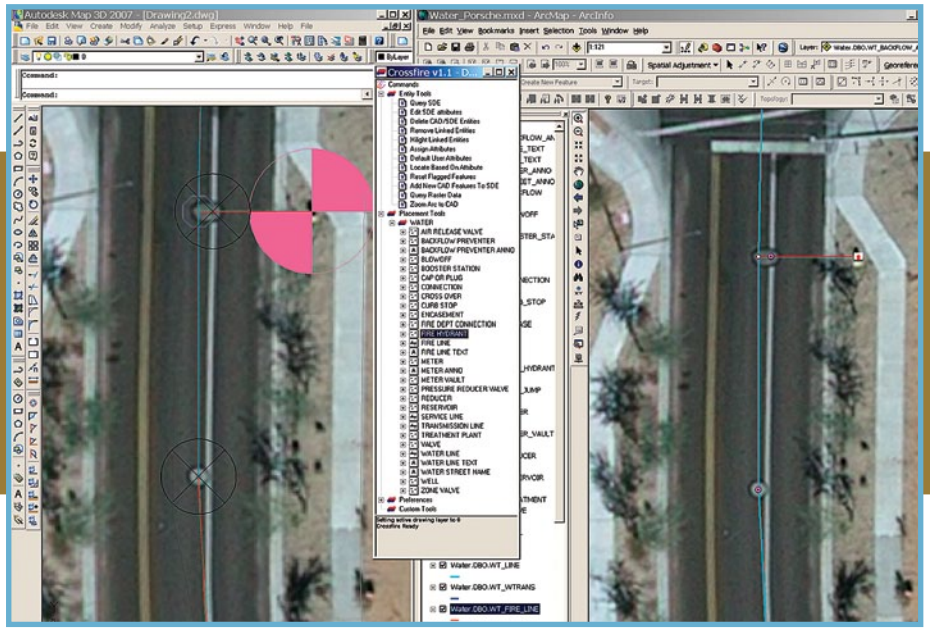

Crossfire is a stand-alone software solution that provides access to ArcGIS from inside the AutoCAD environment.

Surprise Bridges the Gap between CAD and GIS

Located in Arizona's Sonora desert, the city of Surprise is a booming Phoenix suburb with a small-town feel and big city amenities. One of those amenities includes the city's GIS, which has helped meet the technology requirements of one of America's fastest-growing cities. At the peak of the housing boom, from 2006 to 2008, Surprise issued more than 800 new house permits per month.

"GIS is the foundation on which both the city's land information and asset management systems are based," explains the city's GIS Division manager, Lloyd Abrams.

From addressing to planning to emergency routing, nearly every department in the city relies on its enterprise GIS for accurate and current geographic information. But Surprise's spatial data has not always been available to its employees as a GIS enterprise-wide luxury. In recent years, data was provided by disparate departments and various developers, surveyors, and engineers in a CAD format. The GIS division then had to manually integrate data from AutoCAD into an ESRI shapefile before it was accessible to employees working in an ArcGIS Desktop environment.

From there, select employees could perform advanced spatial analysis, model operational processes, and visualize results on maps. The elapsed time between receiving CAD data and being able to view it in the city's GIS could sometimes be lengthy, and CAD data was frequently incoming. Surprise had invested in an accurate survey control network, which city departments and developers alike were required to utilize while acquiring and submitting data. Says Abrams, "The network ensured that incoming data fit well into the city's GIS basemap, but it wasn't a very seamless transition."

Anticipating a housing boom and the onslaught of incoming data related to urban sprawl, Surprise began to migrate its CAD data into an enterprise GIS. Centrally stored in a Microsoft SQL Server-supported relational database management system (RDBMS), AutoCAD map data became

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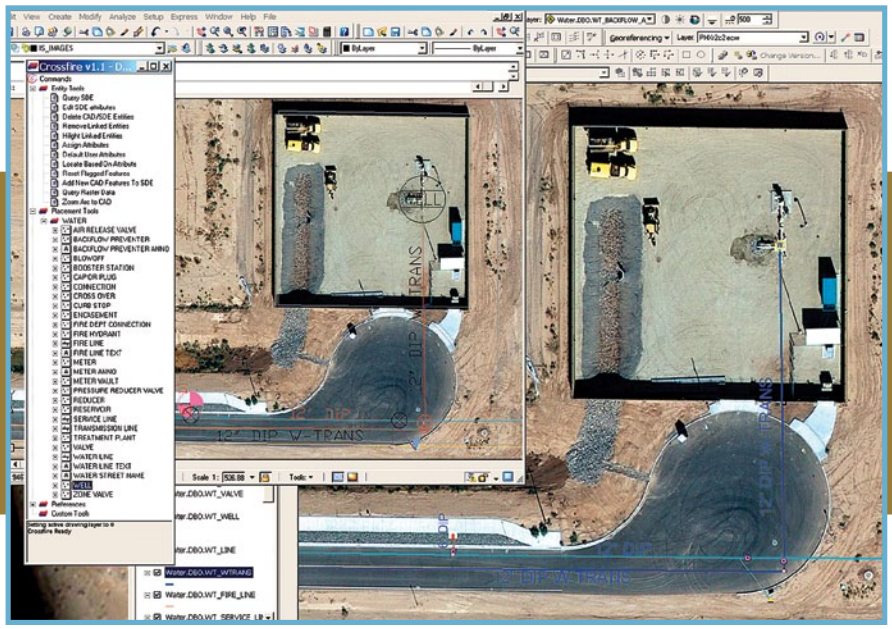

Crossfire preserves the integrity and symbology of CAD blocks when extracting data from ArcGIS Server.

Freeman, *continued from page 72*
accessible via an intranet portal based on ESRI ArcGIS Server.

The upgrade to server GIS gave Surprise the power to streamline business practices and workflows within all city departments. Surprise's permitting system, engineering activities, and utility maintenance tasks all benefitted greatly from the GIS investments. However, Abrams' department of four employees was still tasked with the manual translation of incoming CAD data from developers before it could be stored in the new GIS geodatabase.

With years of an established CAD-based maintenance workflow and the investment in software and expertise, Surprise began shopping for a software solution that could automate the frequent and time-consuming CAD-to-GIS migration progress.

"All data from developers was still coming into us in a CAD format," stresses Abrams. "To keep it flexible for developers, we wanted to keep that business practice alive, but still be able to quickly update the data into our GIS."

The solution to Abrams' dilemma was found just 20 miles away at the root of the urban sprawl. Phoenix-based ESRI business partner Engineering Mapping Solutions, Inc. (EMS), introduced Abrams to Crossfire, a stand-alone software solution that provides access to ArcGIS from inside the AutoCAD environment. Developed and brought to market by EMS, Crossfire was created using features from the software development kits (SDK) of both ArcGIS and AutoCAD. By relying on the core development tools of both software solutions concurrently, Crossfire is able to achieve complete data compatibility. The solution allows a seamless path between CAD and GIS data without the need to manually change file formats, raster datasets, or geodatabase formats. Crossfire's automated editing features, user-friendly interface, general overall flexibility, and easy implementation process was exactly what the city needed.

Since implementing Crossfire, many of the GIS department's lengthy editing chores have been retooled in the ArcGIS environment, thanks to the newfound CAD-GIS interoperability. A single utility pipe split, for example, is better handled using the out-of-the-box commands provided in ArcGIS. But for the larger, more datacentric tasks, such as adding an entire subdivision of utilities (water and sewer) as well as landbase layers including centerlines, address annotation, and parcels, the toolset inside Crossfire is the preferred approach.

"With minimal adjustments to our long-established CAD-based workflow, the staff is able to maintain all GIS data housed in ArcGIS directly using Crossfire," says Abrams. "It allows us to continue to use the custom tools that have worked well for us over the years. Crossfire enables us to leverage our investment in CAD software and staff expertise and still meet the city's GIS needs."

The recent ease in the CAD-GIS integration process has allowed Surprise to grow and better utilize its enterprise GIS both from within and outside the city. Now that its crucial CAD data is easily and quickly available in a GIS environment, Surprise is moving forward with a public-facing website that will give its citizens access to information via a GIS-based portal.

Being able to visualize its data from a geospatial perspective has promoted a shift in thinking within the city. "Our GIS has increased our efficiency in communicating, collaborating, making decisions, and thinking spatially," says Surprise Information Technologies Department manager Randy Jackson. "Not only do maps adorn the walls of many departments, but the geospatial elements of our assets are embedded in almost all of our data. Being able to visualize data in a geospatial context makes us more confident when it comes to making major decisions and dealing with the day-to-day issues."

Matt Freeman is a writer for ESRI.