AutoCAD® Map 3D and
Autodesk MapGuide® Enterprise
White Paper

DATA

AutoCAD Map 3D and Autodesk MapGuide Enterprise: Powerful, Affordable, and Open GIS

With open data standards, CAD integration, and a shared API, AutoCAD® Map 3D and Autodesk MapGuide® Enterprise software products streamline workflows and maximize the value of geospatial data seamlessly—from the desktop to the Web.

From small towns to sprawling metropolises and from rural energy cooperatives to the largest utilities and telecommunications companies, organizations that depend on geospatial data need a way to edit and manage it efficiently. They must also integrate geographic information systems (GIS) with engineering processes that use and generate CAD data. Moreover, virtually all organizations that collect and create GIS and CAD data want to share it with staff or citizens by leveraging the Internet.

GIS technology is advancing to help organizations achieve these goals. Traditionally, organizations have not been able to use preferred tools to edit and create GIS data because their systems store data in proprietary formats. Bringing CAD and GIS data together was possible, but required data conversion processes that can strip CAD data of valuable engineering precision or fail to fully utilize GIS data attributes. Additionally, organizations that share data over the Web needed a more open environment in order to affordably develop innovative applications that extend the value of spatial data beyond engineering and GIS departments.

With AutoCAD Map 3D and Autodesk MapGuide Enterprise as the foundation technologies, Autodesk offers a complete solution that helps organizations to realize efficiencies and optimize the value of geospatial data. AutoCAD Map 3D provides the desktop backbone that supports data creation, editing, and management. Autodesk MapGuide Enterprise delivers powerful, easy-to-use online maps and related information in a development environment that leverages the advantages of open source technology, including low cost of ownership and easier integration with diverse databases.

Autodesk

By turning to AutoCAD Map 3D and Autodesk MapGuide Enterprise, organizations can:

- Integrate spatial data for all geospatial, engineering, and online needs
- Streamline the process of creating, maintaining, and disseminating data
- Leverage CAD-trained staff to keep GIS data current
- Accelerate business processes with easy-to-use, real-time information
- Realize more value from all investments in GIS technology and data

Let's look more closely at how AutoCAD Map 3D and Autodesk MapGuide Enterprise work together to meet the needs of organizations that depend on geospatial data.

AutoCAD Map 3D and Autodesk MapGuide Enterprise: Geospatial Foundation Technology

When used together, AutoCAD Map 3D and Autodesk MapGuide Enterprise enable organizations to use data from initial design to Web deployment more effectively—without translation or data loss. The result—a powerful foundation for meeting core geospatial needs.

AutoCAD Map 3D is a leading engineering GIS platform for creating and managing spatial data. Bridging the traditional gap between CAD and GIS, AutoCAD Map 3D provides direct access to the leading data formats used in design and GIS—no matter how the data is stored. It also makes maintaining and editing spatial data efficient by providing users with a working environment based on the familiar AutoCAD® software platform. This means that CAD-trained personnel can populate GIS data stores with engineering data and keep information up-to-date as they carry out design projects. Additionally, AutoCAD Map 3D enables design processes to utilize integrated GIS functions, such as spatial queries, thematic mapping, and buffer and network analysis, in a single environment for more efficient workflows. The result is a more informed design process, increased productivity, and better data quality. Because GIS specialists no longer have to spend so much time converting and uploading design information into the GIS, they are able to free their time for data discovery and geoprocessing.

Built on MapGuide Open Source, Autodesk MapGuide Enterprise allows organizations to share spatial data over the Web on dynamically generated maps. Information on maps can be combined with tabular data from business systems, such as customer relationship management (CRM) or accounting systems. MapGuide Open Source is free, making it the perfect vehicle for the open source community to develop innovative applications and for organizations to reduce cost of ownership. Taking advantage of open source benefits while minimizing its risks, Autodesk MapGuide Enterprise is backed by commercial-grade support and quality assurance from Autodesk. Organizations can extend their solution with Autodesk MapGuide Studio, an application that allows map authors to stylize data and preview applications as they are created. Designed to be user-friendly, Autodesk MapGuide Studio enables organizations to create maps, Web pages, and applications without extensive technical or programming expertise.

In practice: A midsized public works agency decides to make AutoCAD Map 3D and Autodesk MapGuide Enterprise the foundation for all its GIS-dependent processes. Prior to turning to Autodesk Geospatial solutions, the GIS department was forced to convert engineering data to a proprietary format in order to upload it into the GIS, a time-consuming process that often stripped the data of intelligence. Then the organization used printed map books created by GIS staff to provide field crews and others with system maps. Not only expensive, the map books were out of date almost as soon as they were printed and did not include the latest information from other departments.

The agency has been able to overcome these challenges by:

- Using AutoCAD Map 3D to combine CAD and GIS data in their native formats without having to perform data conversions, ensuring accuracy and virtually eliminating data snapshots
- Leveraging engineering staff trained in AutoCAD to create, edit, and maintain CAD and GIS data in a familiar environment and perform core GIS tasks, freeing GIS specialists for data discovery and geoprocessing
- Sharing real-time maps over the Web with all staff using Autodesk MapGuide Enterprise, which has cut printing costs while increasing the quality and accessibility of information
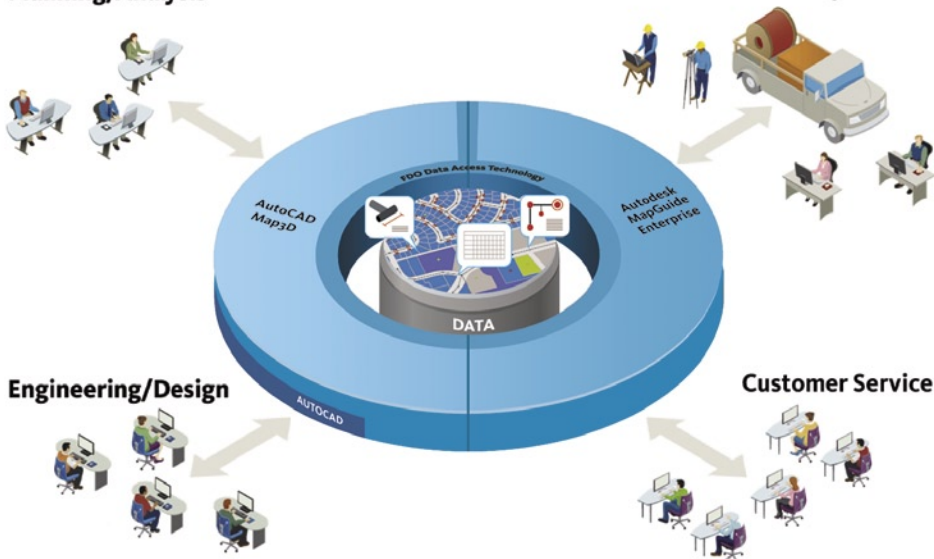
AutoCAD Map 3D and Autodesk MapGuide Enterprise drive the seamless creation, editing, management, and sharing of data.

Open Data Access and Direct Connectivity
Autodesk Feature Data Objects (FDO) Data Access Technology is at the heart of many of the breakthrough advantages of the Autodesk solution. FDO allows users to work natively with a variety of spatial and non-spatial databases and file-formats. This minimizes the need for conversion between formats and helps prevent data loss. Just as importantly, FDO technology enables organizations to work with a variety of data formats without having to understand the differences between the underlying data stores, reducing the time, cost, and training required to use and manage data. FDO is incorporated into all the offerings within the Autodesk Geospatial solution. Autodesk has released FDO as an open source project under the Open Source Geospatial Foundation™ (OSGeo™), which makes it easy for developers to extend its capabilities and achieve faster innovation of industry-focused solutions.

Organizations can take advantage of FDO by using AutoCAD Map 3D to access, manage, and edit data in variety of data stores, including SDF, ESRI SHP and ArcSDE®, Oracle® Spatial, Microsoft® SQL Server, and MySQL databases, and to access raster imagery and vector data through Open Geospatial Consortium™ (OGC™) Web Map Services (WMS) and Web Feature Services (WFS). Additionally, data access can be extended by utilizing open source and third-party FDO data providers. Visit www. autodesk.com/fdo for more details.

As engineers and GIS specialists work with data in AutoCAD Map 3D to create designs and maps, this data can be directly shared with Autodesk MapGuide Enterprise and made quickly available for use on the Web— without conversion or data preparation. So when infrastructure information is updated, authorized users are able to access the information directly. And when proposed designs are ready for review, stakeholders simply go online to view them. With fast access to consistent information, everyone involved in a project stays in sync.

In practice: By using FDO technology included with AutoCAD Map 3D and Autodesk MapGuide Enterprise, the public works agency is able to access, manage, edit, and share data stored in its GIS easily. Additionally, all new map and design work is Web-ready as soon as it is created.

As a result, the agency can:

• Help ensure that internal and downstream users have accurate and up-to-date information

• Extend the advantages of FDO open source technology to data stores not currently supported by Autodesk

• Develop innovative and time-saving ways to use data online

• Realize continued value from legacy data through interoperability and data sharing

**Unified Data Access + Unified API = Powerful Geospatial Platform**
AutoCAD Map and Autodesk MapGuide products share a unified geospatial application programming interface (API) as well as unified FDO data access technology that can be used to build custom applications which share business logic and common code.

Autodesk MapGuide Enterprise works with leading development platforms, such as PHP, Java, and .Net, through powerful APIs. Enabling server-side programming and application delivery, these APIs facilitate easy development without incurring significant development costs. This enables organizations to integrate information from various sources on maps in innovative ways. For example, a utility can create applications that allow field crews to submit discrepancies and as-built information online, and city planning departments can allow citizens to apply for permits using their home computers.

In practice: Simple online applications can be leveraged to save significant time and money. The public works agency develops an application that allows customers to report the precise locations of drainage issues online. And when planned maintenance activities will impact neighborhoods, the agency instantly generates mailings that go to all impacted customer addresses. Those same customers can go online to find updates about the progress of projects in their area.
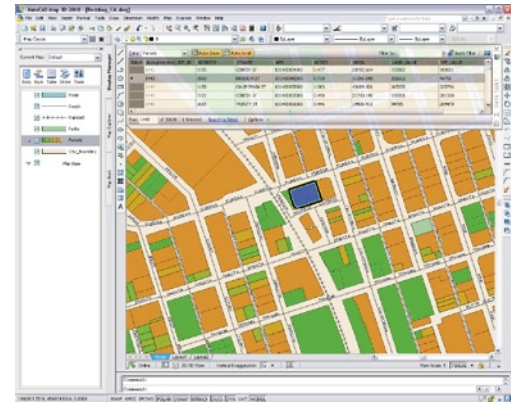
Easily create maps and analyze data with the cartography tools in AutoCAD Map 3D. Perform thematic mapping and publish the results directly to Autodesk MapGuide software.
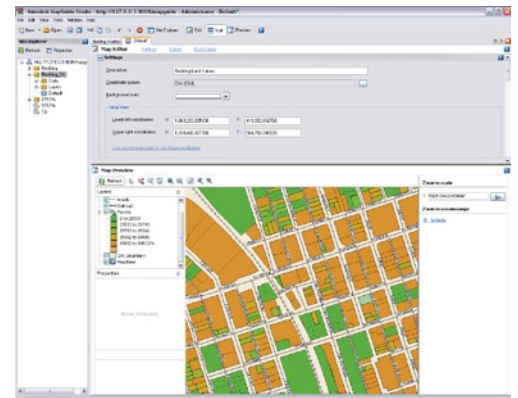
Use Autodesk MapGuide Studio to put the final touches on maps created in AutoCAD Map 3D before publishing to the internet for distribution.
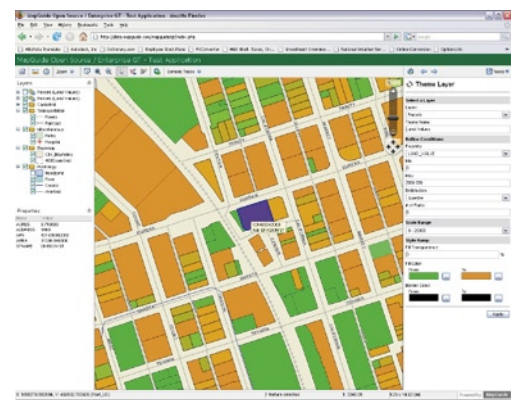
Extend the reach and value of spatial information using Autodesk MapGuide Enterprise. Build business specific applications and deliver your designs and maps created in AutoCAD Map 3D directly to users using any Web browser.

Realizing More Value from GIS Investments

"Before we turned to Map 3D and Oracle, it took about five hours to move project base maps into our design software. It now takes 15 minutes … Being able to access ESRI data with Map 3D is saving our team still more time. It also helps us to get more value from our investment in ESRI technology."

Greg Braswell,
IT and GIS Manager,
San Francisco Department of Public Works
Bureau of Engineering

Extend the Value of Investments with Data Sharing and Interoperability

Through the use of FDO, Autodesk MapGuide technology can be used as a Web Mapping Service (WMS) and a Web Feature Service (WFS). As a Web Mapping Service, Autodesk MapGuide products support a client/server environment. They can retrieve geospatial data from WFS and WMS sites, enabling the use of data from other organizations that share their geospatial data. Used as a WFS, Autodesk MapGuide products allow organizations to share their data, in vector form, with authorized outside organizations. Together, these features support low-cost and widespread sharing of geospatial data—irrespective of format. Autodesk MapGuide Enterprise has also been certified by the Open Geospatial Consortium (OGC) as compliant with its WMS 1.1.1 specification.

In practice: The public works agency finds that much of the data it has collected complements data gathered by the county in which it is located. Working collaboratively, the agency and the county use Autodesk MapGuide technology to build Web Mapping and Web Feature Services to share geospatial data—including legacy data. FDO makes this easy even though the organizations store data in different types of databases and file formats. This data can then be leveraged by engineering and GIS staff using a desktop Web service client such as AutoCAD Map 3D. Both organizations are able to realize significant savings on new data collections thanks to the interoperability built into Autodesk Geospatial solutions.

Conclusion

AutoCAD Map 3D and Autodesk MapGuide Enterprise provide organizations with a robust foundation for all activities that depend on geospatial data. From data creation and editing to management and sharing, AutoCAD Map 3D and Autodesk MapGuide technology drive efficiency and effectiveness by making it easier to work with data—within desktop applications and over the Web. Powered by FDO, these foundation technologies allow users to directly and seamlessly access data in a variety of formats and data storage systems.

By turning to AutoCAD Map 3D and Autodesk MapGuide Enterprise, organizations can:

- Integrate spatial data to serve GIS, engineering, and Web needs
- Streamline the processes behind creating, managing and sharing data
- Leverage CAD-trained staff to keep GIS data current
- Accelerate business processes by blending spatial and other information in Web-based maps
- Realize more value from investments in geospatial data collection and technology

Learn more about how your organization can seamlessly work with geospatial data by visiting us on the Web at www.autodesk.com/geospatial.

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