Integrating Survey, CAD and GIS into a Single Solution

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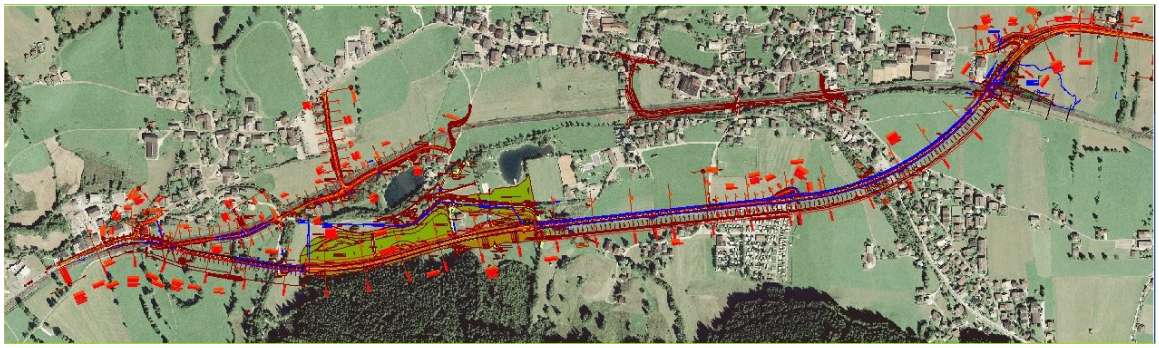

Any enterprise, public or private, that acquires, edits, or provides surveying, civil engineering, GIS or construction services are required to integrate technology into their processes. Not doing so makes competing with others who have impossible.

For decades hardware and software providers have targeted their products to the civil engineering, surveying, GIS, and construction markets. The result of this is a formidable, segmented and very long list of products that users are faced with researching and deploying.

The situation is further complicated by most customers requiring solutions that address the requirements of multiple market segments. For example a savvy civil engineering firm will require a solution for survey, CAD, GIS and construction. This can be both expensive and intimidating to the customer.

Managing software licenses, training staff on multiple platforms and integrating different software applications exacts a heavy toll on principals, CAD and IT managers. It is evident that the optimization and integration of hardware and software into a single, viable solution provides value to everyone.

Through partnerships with Trimble, Leica, Google and Carlson Software Autodesk Civil 3D 2007 provides true, field to finish design capability as well as GIS and construction functionality. The following is a list of some of the benefits.

1. **Exploit data compatibility / interoperability**

Autodesk Civil 3D enables users to work with any DWG drawing files, read and write MicroStation® DGN drawing files, and import and export Autodesk Land Desktop project data. In addition, Civil 3D 2007 works with LandXML data and GIS data formats, including ARC/INFO® coverages and Export (E00), ArcView® Shape, etc.

Using the free tools from Trimble, Leica, and Carlson Software Civil 3D 2007 can push and pull survey data to and from most modern data collectors. Proposed models created in Civil 3D may be exported using these tools for Machine Control Grading systems. The Google Earth tool allows Civil 3D data (points, DTMs, alignments, corridors, etc.) to be exported and visualized in Google Earth.

2. **Reduce purchase, deployment, maintenance, and support costs using a single solution that is equally well suited for civil/survey projects of any type or scale**

Autodesk Civil 3D 2007 software provides the flexibility, depth of functionality, and power to address a variety of surveying and engineering projects. This single product is equally well suited for a subdivision, road reconstruction, site, highway, utility layout, landfill, or other civil engineering projects. Survey, civil engineering and engineering tech, and drafting professionals can have the flexibility of working on any project at any time without needing to become experts in many niche products.

3. **Save time and money with intelligent, dynamic model**

Autodesk Civil 3D 2007 software is a powerful, mature civil engineering tool. It creates relationships between objects so design changes update dynamically. Using Civil 3D 2007, designers and engineers can become significantly more productive by using a single model for design elements, drafting and reports, and analysis and visualization. In fact, based on results from pilot projects conducted in 2005, where Autodesk® Land Desktop 2006 software was used side by side with Autodesk® Civil 3D® 2006 on production projects, Civil 3D yielded productivity improvements of between 25 and 100 percent.* With Autodesk Civil 3D, a change to one part of the design propagates throughout the entire project. For example, if you lower the edge of a parking lot, the software updates all the slopes leading to that pavement line. Change the curve length on your alignment and the profile, corridor model, and plotted cross sections all update instantly. If you lower a building pad, you can immediately retrieve updated volumes and display the new limits of construction. Civil 3D 2007 effectively maps the civil engineer's work process into an easy-to-use and powerful software environment.

4. **Complete projects faster and reduce the chance of coordination errors using Civil 3D Project environment**

Autodesk Civil 3D 2007 has expanded multi-user functionality that enables small and large project teams to complete projects more quickly and with less risk of errors. Multiple members of a design team have simultaneous access to survey observations, points, surfaces, alignments, profiles, and pipe networks so that more people can be

involved in the surveying, design, and plan production process. For example if an alignment is shared across multiple drawings with each drawing having different annotation and object appearance and the master alignment changes, the alignment in the secondary drawings updates automatically.

5. **Increase efficiency and profits with easy-to-use, relationship-based surveying, design, and drafting procedures**

Civil 3D provides direct interaction, tabular editing, a project workspace interface for model elements, real-time inquiry of project data, and an efficient style mechanism to control automated drafting. Accessible from a simple and powerful interface, these features help new users become productive quickly. For example, a pipe network can be edited graphically to change the location of a manhole or the diameter of a pipe. When the diameter is cahnged, the system automatically snaps to match pipe diameter values in your pipe library. Numeric input in the tabular editor to change the pipe diameter, slope, invert elevation, sump, and so on is also available.

6. **Gain process efficiency via unified surveying, design, and drafting environment**

In Civil 3D 2007, experienced AutoCAD users work in a familiar environment with tools and processes they already know, while taking advantage of new engineering tools and features. That means if a user is already productive using AutoCAD for civil engineering design and drafting production, the user can expect to increase productivity without significant learning time.

7. **Help clients make the best decisions possible by providing richer design options, faster**

Autodesk Civil 3D 2007 enables users to explore conceptual proposals and complete final designs faster with dynamic, real-time interaction between the objects that are part of the civil engineering model. For example, when a road alignment is changed, the software instantly updates parcels, profiles, the corridor model, design surfaces, and volumes. Also, the rules-driven design tools in Civil 3D help to ensure that design standards are reflected even through conceptual proposals.

8. **Experience faster plan production**

Autodesk Civil 3D 2007 dynamically links drafting elements, such as alignment or parcel labels and tables, with the engineering model. A change to any part of the model produces updated annotation. These intelligent labels and tables also keep track of the drawing scale and view orientation. For example, the scale of the plan is changed from

1:50 to 1:100, the annotation automatically resizes to maintain the proper plotted size. If the view orientation of the plan is rotated, the annotation of the objects automatically rotates to maintain plan readability. Automatic updating minimizes time-consuming and costly manual editing of drafting elements and helps ensure the accuracy of the final construction documentation.

9. Reduce risk of drafting and design errors

Because design and drafting objects are connected in the engineering model, changes that would typically require manual redrafting update automatically. For instance, if the vertical design alignment is adjusted, the software automatically updates the road model, redisplays proposed contours, recalculates volumes, updates profile labels, and corrects section plots for the road. That means less time is spent on revisions peace of mind is gained from knowing all design data is accurate and up-to-date.

10. Build a foundation for your custom solution

Autodesk Civil 3D 2007 is a powerful platform for developing custom civil engineering applications. With its rich API (application programming interface) and a variety of third party applications in development, you can tailor Civil 3D to suit your needs.

Pete Kelsey
I first learned to use AutoCAD in 1992. I quickly decided to focus on Civil Engineering since it seemed to fit well with my surveying and mapping experiences in the US Army and my geology studies at the University of Iowa.

In Arizona, I worked in several civil engineering firms who hired me to transition them from manual to CAD drafting. After learning, implementing and training others on DCA, Softdesk, and AutoCAD, I knew that teaching was what I wanted to do.

In 1996, I became an independent consultant, providing technical services for customers all over the world. In an effort to clone myself due to overwhelming demand, I started K-TEK in 2001. The team grew to 74 people in seven countries in five years. My yearning to return to the customer realm led me to sign on with Autodesk in 2006 as a technical evangelist.

Photo

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