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Destroying Seven Myths of Autodesk GIS

May 2003

Executive Summary

CAD and GIS technologies have advanced considerably in the past decade. The software tools still maintain domain specific design or spatial analysis features, but companies like Autodesk® are helping professional mappers and engineers collaborate by better integrating these tools. Yet despite enhanced integration, there are still many commonly held myths about GIS software that has strong CAD integration. In fact, these systems are often referred to as *CAD-based GIS*. However, the term CAD-based GIS is misleading because it suggests that GIS tools were added to a CAD system as an afterthought or as an extension to the core design technology. This paper will dispel any myths about Autodesk GIS software, demonstrating that Autodesk offers complete GIS solutions. And still, Autodesk GIS software is well integrated with CAD systems, enabling GIS and engineering professionals to collaborate more closely and ensuring the data integrity, accuracy, and precision that both engineers and GIS professionals demand.

The Seven Myths

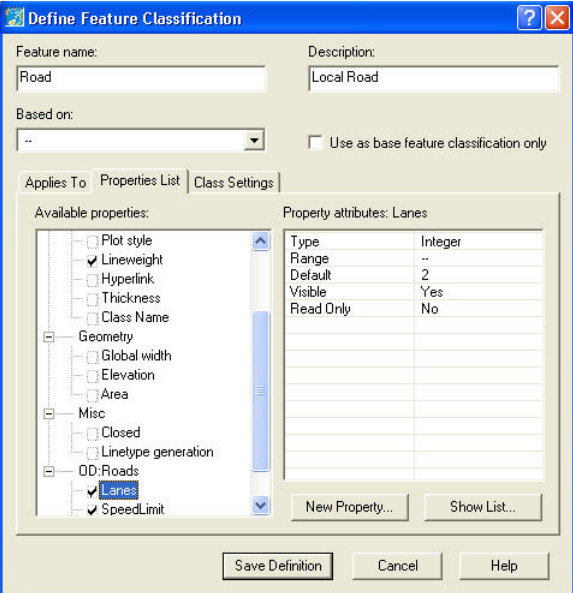
- 1 Features and entities only support simple properties like linetype, layer, and color
- 2 Data and analysis cannot support 3D and sophisticated terrain surfaces
- 3 Polygons are unsupported
- 4 Topology and spatial analysis are unavailable
- 5 Access is limited to single users
- 6 Data storage is limited to drawing files only
- 7 Autodesk products are limited to producing paper maps

Precision GIS Destroys the Myths

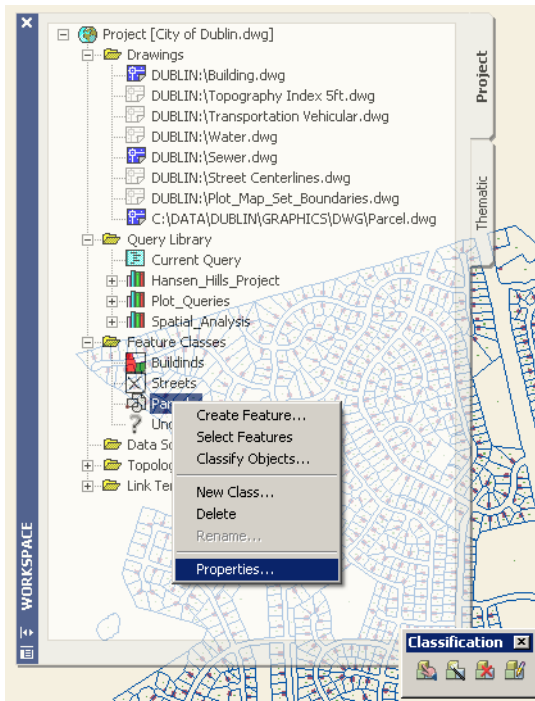
Today there is still an outdated view of GIS software that is closely integrated with CAD technology. For instance, some believe that Autodesk GIS software is simply enhanced AutoCAD software. This misperception arises because of Autodesk's history as a CAD company and because CAD is not well understood by many organizations that use traditional GIS software. Yet Autodesk offers powerful GIS software that embraces CAD for an enhanced GIS solution that fits the workflow and lifecycle needs of thousands of organizations worldwide.

Myth I: Features or entities are restricted to simple CAD properties like linetype, layer, and color

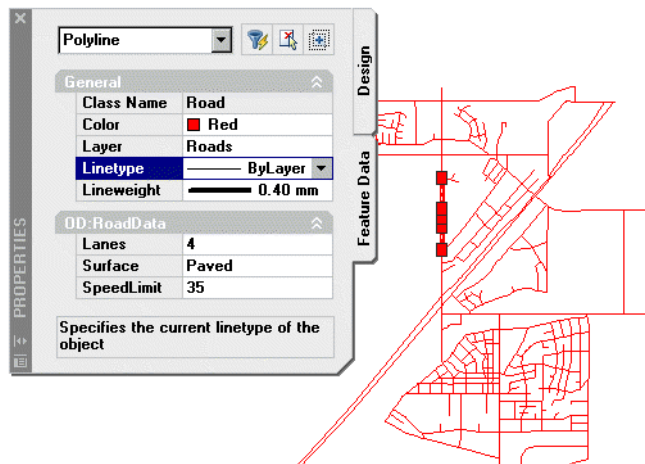
Reality: Autodesk Map™ is capable of working with both CAD entities and GIS features and their corresponding attributes. For example, Autodesk Map can organize data by layers, as in a CAD system, but can also classify data into intelligent features like roads and parcels, as you would expect in a GIS. In Autodesk Map software, features are linked to data tables that describe their attributes, such as the number of lanes and surface type of a road. And, of course, you can still classify objects by their presentation attributes, like color and linetype.



This image shows an Autodesk Map feature classification tool used by administrators when initially creating their data design, destroying the myth that Autodesk tools support only graphical layer properties like linetype and color.



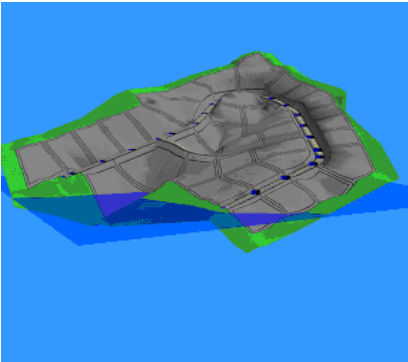
For the end user, the Project Workspace displays all the data you need including feature classes.



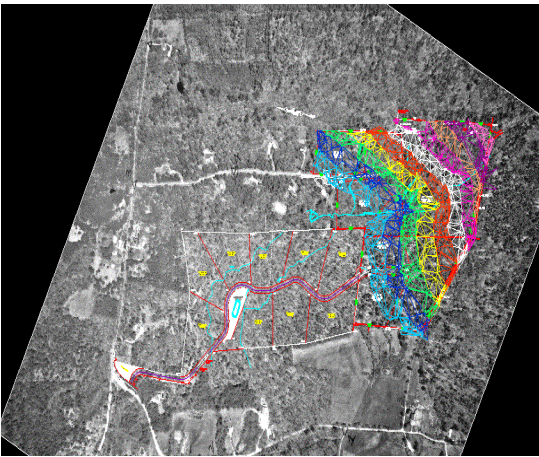
This illustration shows the Feature Data tab of the Properties palette displaying feature data for the selected object. You can easily edit these objects based on the administrative settings.

Myth 2: Solutions are limited to two dimensions

Reality: Modern GIS and CAD systems are completely three dimensional and support full 3D data creation. Autodesk's software supports a number of 3D applications, including floodplain analysis. Conversely, many traditional GIS packages support only 2D features and analysis or offer 3D analysis only as an additional and expensive extension.



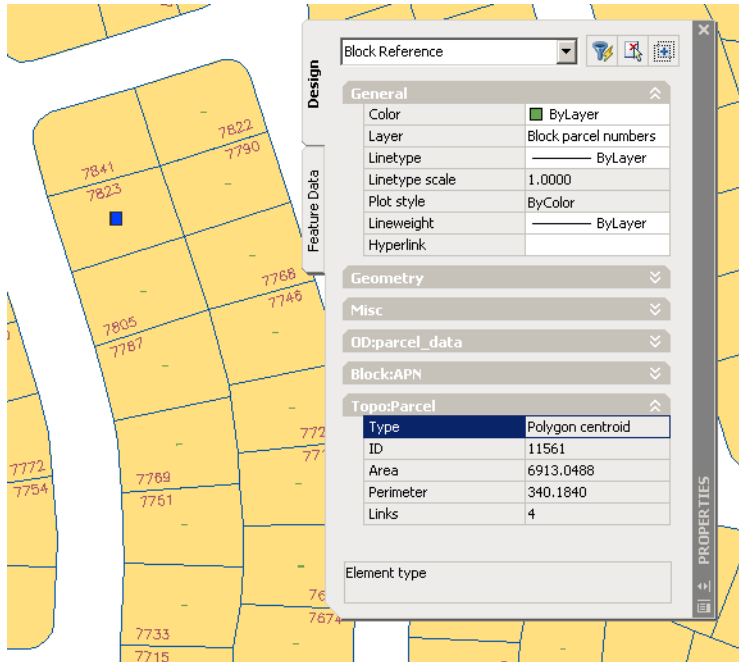
This image shows a 3D terrain model and flood analysis within Autodesk GIS software, functionality that comes as a standard feature.



This raster imagery is overlain with land parcels and a Triangulated Irregular Network or TIN, a standard form for storing and representing a 3D model. Again, this 3D analysis is a standard feature in Autodesk software, not an expensive add-on.

Myth 3: Only “simple” objects like lines are supported

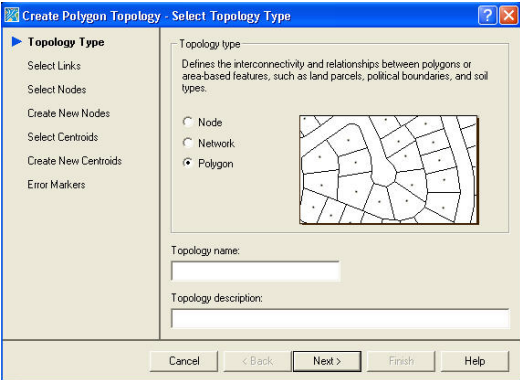
Reality: Precision mapping software like Autodesk Map can create simple line objects as well as create and edit more complex objects like user-defined features, networks, and polygons, including island and nested polygons and polygon collections. You can choose the level of data complexity appropriate for the project at hand.



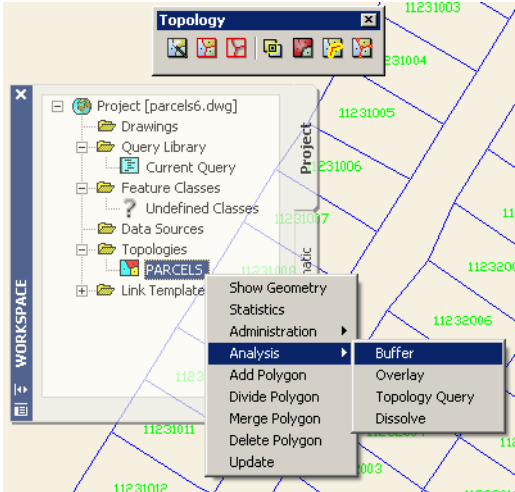
This image demonstrates the object data editor in Autodesk Map, helping users to visualize complex geographic object models including polygon topology.

Myth 4: Autodesk software does not offer topology or topological operations

Reality: Autodesk GIS supports both CAD and GIS topology. For example, Autodesk Map enables you to use a combination of interactive and automated CAD and GIS tools to create and clean up geometry for generating a variety of topologies. These topologies include nodes (for generating collections of points), networks (for linear networks), and polygons. The Autodesk Map Series also supports a variety of topological operations, including shortest path trace, flood analysis, polygon overlay, dissolve, and buffering.



Autodesk Map, like any GIS tool, allows its users to construct and model topologies.



This example shows the Project Workspace delivering access to various spatial analyses.

Myth 5: Access is limited to a single user.

Reality: Autodesk GIS supports multiple users in several ways. For example, at the drawing level, Autodesk Map employs the object-locking feature, which enables multiple network users to simultaneously retrieve, edit, and save different objects while working in the same source drawing. If Autodesk Map is storing its data in a seamless spatial database system like Oracle Spatial or the Autodesk GIS Design Server, you can also lock objects in the database, providing hundreds of users simultaneous access to your data warehouse. In fact, Autodesk customer France Telecom has 1,425 Autodesk Map and 570 Autodesk Raster Design users working in a multi-user environment.



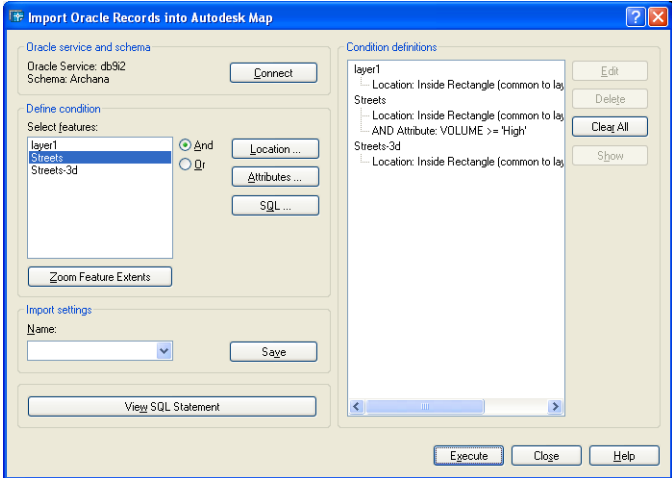
In addition to accessing central GIS databases with long transactions and version control, Autodesk also offers feature locking tools for file-based multi-user systems. Users can access information about who in their organization is working on a particular file as this dialogue shows.

Myth 6: Data storage is drawing based only

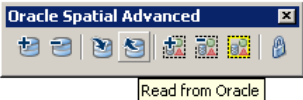
Reality: Autodesk GIS gives you the flexibility of working with both CAD drawings and GIS databases as required. For example, Autodesk GIS software can work with

- A single drawing or GIS file
- Multiple drawings or GIS layers organized into a single project
- Project drawing with external databases
- An Oracle Spatial database
- An Autodesk GIS Design Server database

Furthermore, Autodesk solutions store digital terrain models, point files, and alignments for roads and sewers in external data files for speed and multi-user access. This range of data storage options means that you can choose how you want to manage data.



When you need to edit a drawing, you import the objects you want from Oracle into Autodesk Map by selectively retrieving records based on location, attribute, or SQL conditions.



The Oracle Spatial Advanced toolbar above provides quick and easy access to a number of Oracle Spatial features.

Myth 7: Autodesk software is used primarily to produce paper maps

Reality: Although producing paper maps is important, more critical is the ability to produce paper and electronic renderings that are accurate and precise. Mapping and engineering professionals require specific symbology on designs, whether the features are shown in a browser, on a laptop, or on paper. Autodesk tools maintain the appearance of engineering or cartographic symbology for both digital and print media. In addition, Autodesk GIS products fully support the use of mobile devices, helping organizations take the value of up-to-date precision data out of the office and into the field where much of their work is actually performed.



Autodesk GIS software delivers accurate, precise, and attractive maps beyond a printer and plotter to mobile devices in the field where fast decisions are made with up-to-date information.

Conclusion

There are misconceptions about Autodesk's GIS and Civil Engineering solutions that imply that the software is first and foremost a CAD-based system. Indeed, Autodesk leverages and integrates its expertise in CAD with its other GIS and engineering tools. However, Autodesk offers software that is first and foremost a GIS solution. Products that exemplify this are Autodesk Map, Autodesk MapGuide, and Autodesk Envision. As the technologies of CAD and GIS mature, Autodesk is leading the industry in offering discipline-specific tools that are integrated with other disciplines, helping GIS and engineering professionals collaborate while still addressing their specific needs.

About the Author

With a PhD in photogrammetry and information science from the University of California at Berkeley, Sean Curry has more than 24 years' experience in the GIS industry. He has worked for Autodesk as a GIS product manager and senior director of business development, for ESRI as senior manager of enterprise spatial systems, for Trimble Navigation as director of software development, and for Pacific Bell as technical director of spatial technologies. He is currently a consultant and industry analyst based in the Pacific Northwest.

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