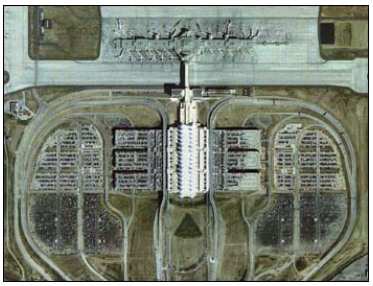
Denver International Airport



"The data sets we manage are large. We try to keep them current by keeping them relevant, whether it's to a surveyor or a facilities manager. We try to stay user-driven—find out what programs our users like and go with them, if we can stay within our budget."

David Dixon, DIA
GIS and Engineering
Records Group

Autodesk Software Keeps Denver's Airport Flying High

Denver International Airport must be managed as if it were a small city. In fact, it's more like a large city. DIA is one of the largest airports in the world—the first one to land three airplanes at the same time, on parallel runways, in bad weather.

Finished in 1995 at a cost of almost $5 billion, DIA sprawls across 53 square miles, twice the size of New York's Manhattan Island. It is populated by 23,000 employees and 106,000 passengers every day moving through to 1,450 flights. Snaking underneath the airport are a giant automated rail system, sewers, baggage conveyors, utility tunnels, 5,000 miles of fiber-optic cable and 11,365 miles of copper cable.

The airport's caretakers monitor this infrastructure through a series of online models and GIS maps. While the hundreds of thousands of drawings in the airport's Oracle® facilities database are different file types—DWG, ARC, raster, vector—by the time they reach DIA's end users, most have been converted to AutoCAD Map® files. The airport standardized on Autodesk software, a good fit since AutoCAD® was already the front end for its facilities management system.

DIA engineers maintain the airport's labyrinth of facilities with a cluster of Autodesk products including AutoCAD® 2000i, Autodesk MapGuide®, AutoCAD Map, Autodesk® Land Desktop, Autodesk® Survey, and Autodesk® Civil Design. DIA's engineering office has made 166 gigabytes' worth of maps, drawings, plans, and other documents available online to the airport and airline staff. Beyond the Oracle back-end system, this network runs on a mix of Unix and Windows NT® servers, with a Windows® front end.

Agency Challenges

Several groups of users need fast information about the airport—not just engineers and facilities people, but contractors, consultants, property managers, and administrators preparing reports. 3D drawings display the airport's baggage-handling complex below ground and airspace patterns above it. "We often prepare map and design data for these offices, producing it on hard copy, CDs, e-mail, and other formats," said David Dixon, the network administrator who oversees the airport's Geographic Information Systems (GIS) and Engineering Records group.

DIA needs web-ready mapping software because many end users, particularly utility engineers, need to pull maps on their own from a browser-based interface. Some users also read maps on the airport's web-based intranet, which serves 1,000 people. Because AutoCAD Map embraces several kinds of map data and quickly serves it out into web formats, it functions better in such a situation than many less flexible GIS programs in the marketplace, which can take hours to convert files.

The airport's engineers need detailed GIS charts and schematics to maintain systems such as HVAC (heating, ventilation and air conditioning), electric wires and fixtures, and escalators. If a water line breaks, engineers want to pull up a plan, pan and zoom to the correct place, locate the shutoff valve, and quickly relay its position to the field. But the airport has neither the time nor the budget to spend on training every desktop map user. That's the kind of work environment Autodesk products were invented for.

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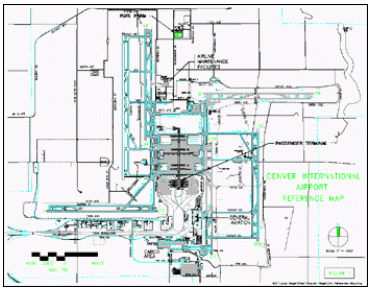

Denver International Airport reference map

"Our end users don't have time for training," Dixon says. "But they're pretty good at 'mousing around' on their own. Our engineers and contractors need to be able to find map data directly, with a straightforward interface. That way they don't have to wait in somebody's office for help."

Leveraging Design Data

Working with Autodesk reseller Avatech Solutions and government marketing partner DLT Solutions, Dixon's staff has found ways to use Autodesk software to make DIA's 100,000 CAD drawings more accessible.

- DIA created a many-tiered, interactive model of the airport that can be configured to reveal whatever information the user needs.
- They distributed Autodesk's Volo™ View Express for users to review and mark up CAD drawings without AutoCAD software, making it possible to deliver map data to a broad range of people who aren't necessarily familiar with using CAD maps.
- The airport adopted Autodesk MapGuide to display maps of underground utility locations on a browser. Most large airports deal with contractors, consultants, or airlines that require access to facilities maps. Autodesk MapGuide turns internal GIS maps into web pages that can be shared by several users at once.

"When you offer the huge amount of data we do, the first thing you learn is that no one wants to wade through it all," Dixon says. "So we offer 'quick picks,' where you can hit a button and get what you're looking for instead of getting lost in a huge database."

Land Management

With so much ground to cover, DIA surveyors and builders often have to modify their maps (or generate new ones) to reflect improvements to roads, drainage, runways and other work. They take their survey point measurements with GPS devices or other surveying tools, then download that data into Autodesk Land Desktop. Using the companion products Autodesk Survey and Autodesk Civil Design, the surveyors manipulate the survey data, shape terrain models as needed, and sometimes overlay their work with GIS facility diagrams to create multilayered maps.

The software system was intended to make the maps useful to people. "The data sets we manage are large," says Dixon. "We try to keep them current by keeping them relevant, whether it's to a surveyor or a facilities manager. We try to stay user-driven—find out what programs our users like and go with them, if we can stay within our budget."

He envisions a time when technicians will never have to carry paper maps out to a trouble spot, relying instead on handheld devices. That day isn't quite here yet, but it's probably not far off. Until then, Denver's airport—the largest public works project in the world—is an open book to any employee with a computer.

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