

AutoCAD®  
2007

# Features and Benefits

## Design, Visualize, Document, Share

Realize your ideas with efficiency and clarity, from conceptual design through drafting and detailing. Whether you're creating solids and surfaces, studying the effects of lighting on your design, exploring design alternatives with walk-through animations, or producing an entire sheet set, AutoCAD® 2007 software has the tools to make it happen quickly and accurately.

Autodesk provides a complete set of tools to help designers clearly convey their design vision to clients and then quickly and accurately document those visions so that projects are completed on time and within budget. AutoCAD® 2005 built on the dramatic productivity gains of AutoCAD® 2004 software by adding tools that help designers efficiently manage sets of drawings. AutoCAD® 2006 enabled designers to work even faster and smarter on a wide range of day-to-day tasks with powerful new drafting features such as Dynamic Blocks and Dynamic Input.

Now, AutoCAD 2007 focuses on improving designers' ability to create, navigate, and edit a conceptual design, clearly present the design to a nontechnical audience, and then easily document the design using all the powerful AutoCAD drafting tools. AutoCAD 2007 provides a huge productivity boost to users who currently do conceptual design in AutoCAD and to users who would like to do so. The common set of underlying technology "engines" and enhanced interface tools mean interoperability and cross-training between AutoCAD and Autodesk® products such as Autodesk® Revit® Building and Autodesk Inventor® software applications has never been better.

From turning thoughts into designs to creating compelling, rich graphical presentations that market your work to documenting that work as an entire set of drawings—AutoCAD helps you realize your ideas.

This Features and Benefits guide outlines the key features of AutoCAD 2007 by presenting the problems designers might currently encounter when creating and presenting conceptual designs, and by outlining the solutions provided in AutoCAD 2007. This guide also details the bottom-line benefits to designers and organizations.

This guide is not intended as an exhaustive list of the new AutoCAD 2007 features. To view a comprehensive list of new features, visit [www.autodesk.com/autocad-features](http://www.autodesk.com/autocad-features).

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# Design

AutoCAD software provides powerful tools for the creation, management, and sharing of design documentation. Companies around the world use these documents and drawings to create buildings, landscapes, sheet metal parts, and much more. There is a key step that precedes the creation of drawings, however. That step is conceptual design. During this phase, designers lay out their vision for how to meet the customer's requests and solve their problems. It is during this stage that the customer is sold on the abilities of the person or firm that they are discussing doing business with. Large and small firms alike go through this stage, often repeating the process many times during the different phases of a project, from bid to contract signing to project completion.

Currently, small firms commonly use simple tools such as hand sketches or foamcore models to convey their ideas. Larger firms may have a single specialist or a whole department that works only on the presale design process using complex and expensive dedicated software tools. Many firms use AutoCAD software to complete the conceptual design process, but the tools to produce these hand sketches or models in older versions can be difficult to learn and use. Using AutoCAD for the conceptual design process is especially challenging for small firms that cannot dedicate a resource to learning the more complicated tools found in the older AutoCAD versions.

AutoCAD 2007 makes the creation, editing, and navigation of solid and surface models simple and intuitive. It brings the power and flexibility of AutoCAD lines, arcs, and circles to cubes, surfaces, and spheres. It enables even an occasional AutoCAD user to quickly and easily create a model of a design. Designers can explore design alternatives with a client, and then, after the contract has been won, reuse that model data as a basis for the drawings needed to build the design.

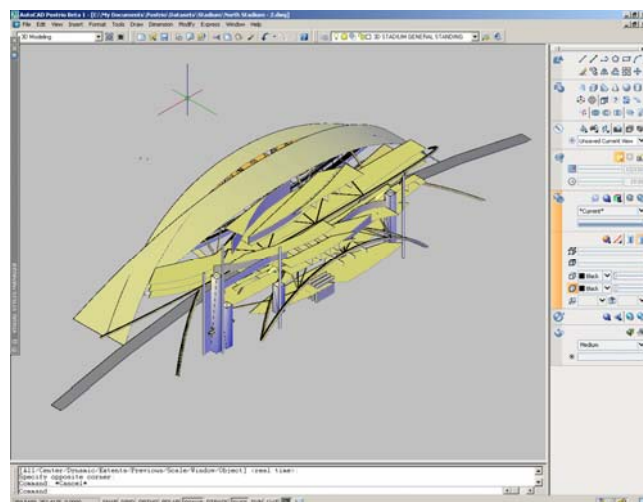
## Design Environment

### Problem

The solid and surface tools in previous versions of AutoCAD are not integrated, making creation of these objects more difficult. There is no single place that users go to create a solid or surface model. Instead, they are forced to jump around and “discover” features as they move through the AutoCAD application. In addition, the tools used to edit a model are completely different from the tools used to edit drawing geometry. This lack of integration makes editing difficult. As a result, users sometimes delete their work and start over rather than trying to remember how to edit a solid model.

### Solution

AutoCAD 2007 introduces the new design “dashboard.” This interface element consolidates all solid and surface modeling tools into a single place and enables users to see at a glance the tools and workflow available in AutoCAD. AutoCAD 2007 also takes the intuitive, grip-based editing features introduced for drafting in previous AutoCAD versions—such as Dynamic Input, ortho, and



tracking—and integrates them into solid and surface modeling.

**Benefit**

Quickly create and edit solid and surface models without the extended learning and relearning time necessary in older versions of AutoCAD software. A common set of editing tools means that no retraining is required to edit solids as opposed to lines, arcs, and circles. This capability increases speed and decreases the training time required to be productive with solid and surface modeling in AutoCAD.

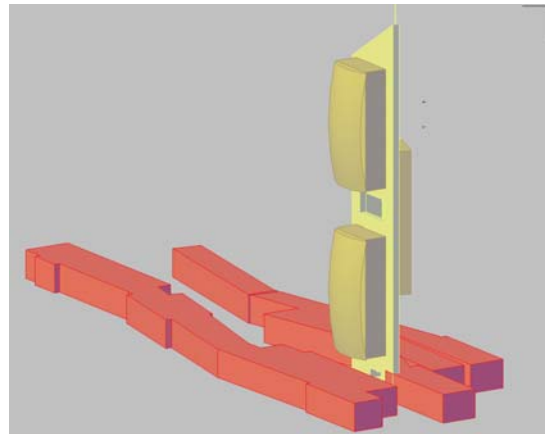
## Solid and Surface Modeling

**Problem**

To perform common conceptual design tasks, such as massing studies, mechanical prototypes, or landscape design, users must be able to quickly and easily place and manipulate multiple, basic solid shapes. They also must have the ability to create complex surfaces from both simple profiles and complex linear data.

**Solution**

New tools in AutoCAD 2007 make it much easier to create solid and surface models. The redesigned interface uses a single, easy-to-learn environment for creating both solids and surfaces. Creation and editing of surfaces (as opposed to mesh objects) have been added, and users can now create solid objects that have faces defined by more complex surfaces.



**Benefit**

Using solids and surfaces in AutoCAD enables designers to avoid the use of expensive, third-party software tools and to bypass the use hand sketches and physical models that can be difficult to update or modify.

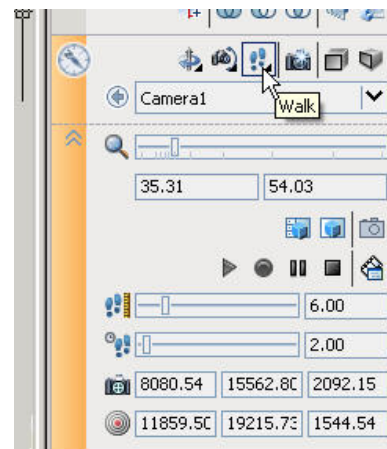
## Model Navigation

**Problem**

Navigation is another common problem when working with models in previous versions of AutoCAD. Designers must use the Pan and Zoom commands repeatedly as they create, edit, and examine 2D drawings. Basic 3D navigation tools are difficult to use. It is not possible to pan and zoom in a perspective mode. In addition, rotating the model to the correct orientation can be challenging, and users cannot edit models during use of the Rotate or Orbit command. These tools need to be more closely integrated with the AutoCAD user's working habits.

**Solution**

AutoCAD 2007 software expands existing tools by allowing transparent pan or zoom while in perspective mode and by allowing



editing during use of the Orbit command. It also introduces several new tools such as “walk” mode, which enables designers to walk through a model in the intuitive manner used in computer games. A new camera function enables designers to take a quick “snapshot” of how their design will look from a specific point of view in the design.

### **Benefit**

These improved navigation tools make designers more productive because they encourage interaction with models during creation and editing. They also enable designers to more easily explore and understand their own designs. Designers can more easily evaluate design alternatives, uncover flaws early in the design process, and explain design choices quickly and efficiently during and after the design process.

## Visualize

During conceptual design, designers often need to convey their design vision to someone who is not accustomed to looking at drawings. This process happens at multiple stages of the project lifecycle, for instance, presenting a preliminary concept to a client to make sure that the design is proceeding in the right direction. During this phase a sketch may be best because it indicates visually to the client that the design is fluid and unfinished and encourages detailed feedback. At another stage in the process, for instance, in the final bid package, the designer may want to put in a rendered image so beautiful that it looks like a photograph of the completed project. This type of image can pull an entire sales presentation together and create the excitement necessary to close the deal.

Previous versions of AutoCAD have tools that address some of these problems (for instance, the ability to create a rendered image), but they are time consuming to learn and use. In addition, because earlier versions lack common visualization tools (such as a selection of screen display methods), designers are forced to use third-party products if they want to achieve this type of look in their presentations.

AutoCAD 2007 solves these problems by significantly enhancing existing visualization tools, making them much easier to both learn and use. This release also simplifies the process of modifying images after they have been created. In addition, several new tools that complete the suite of AutoCAD visualization tools, have been added. These improvements make it unnecessary for AutoCAD users to spend extra time and money to learn additional software tools.

## Visual Styles

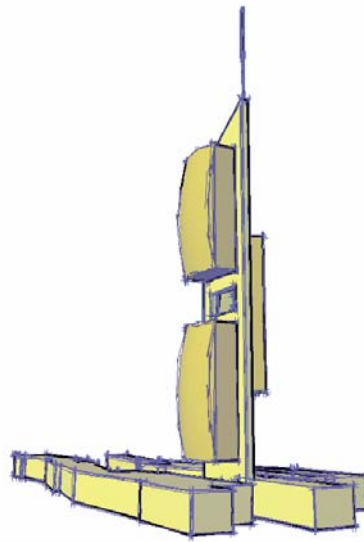
### **Problem**

A designer using AutoCAD may need to pull a design idea together quickly, performing the preliminary work in AutoCAD to take advantage of the software’s documentation features. At this stage, the design idea is an abstract thought, and the AutoCAD shade modes—wireframe, flat shading, and Gouraud shading—are too formal to convey the fluid nature of the design.

Popular conceptual design tools use display modes to give the model a “sketchy” or unfinished look while the designer is working. The resulting effect is deliberate, so that the model resembles a hand-drawn sketch.

### Solution

The AutoCAD 2007 visual styles tools relate to all elements of the 3D display, including the creation of new face styles, edge line effects, materials display, shadow display, lighting display, perspective, and parallel/orthographic views. Designers can use these new tools to easily create a visual style that fits their needs.



### Benefit

Designers can use a visual style that best represents the current stage of the project to most clearly communicate the design. They can do this effortlessly in the familiar AutoCAD environment without having to learn or purchase additional software tools.

## Animations

### Problem

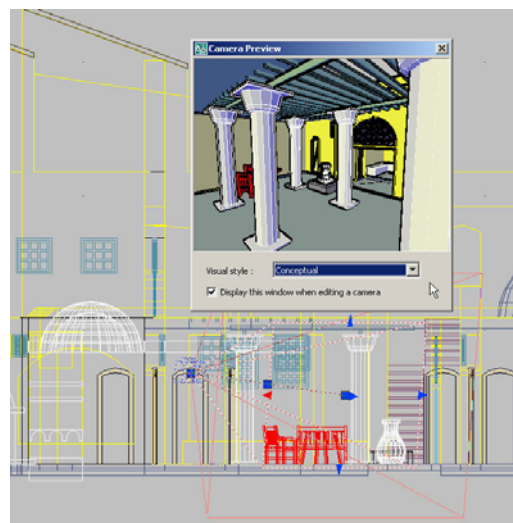
Earlier versions of AutoCAD include tools to create informative static images, but clients are demanding more. They want video effects that dynamically display the features of the proposed design. They want to be able to virtually walk through or around the design so that they are not constrained by a single framed image. Earlier versions of AutoCAD do not include tools that enable a designer to take a client on an interactive tour of the design or to create a recorded animation of the design to send to a client for review.

### Solution

Using the AutoCAD 2007 Walk and Path animation tools, a designer can identify points of interest in a model, and then create a path or simply walk past the points of interest to create an animation file for distribution. Designers can use different visual styles for the animation to get just the right visual effect. The designer can also use these tools dynamically to take the client on an “over the shoulder” tour of the design.

### Benefit

These new interactive walk and animation tools mean that designers can effectively review their designs and expose any flaws early in the design process, before problems occur in the final product.



## Lights, Materials, and Rendering

### Problem

Proper lighting can dramatically affect a rendered image, completely changing the look and feel of a design. In previous versions of AutoCAD software, it is difficult to accurately place a light in a drawing and understand how it will affect the scene before rendering it. Designers must go through several iterations of placing and adjusting the lights and then rendering the design—a time-consuming and tedious process.

## AUTOCAD 2007 FEATURES AND BENEFITS

Proper display of materials is crucial to making a rendered image accurately reflect what the completed design will look like. The texture of stone or wood, the different looks of brushed aluminum or stainless steel can “make or break” a design when it is presented to a client. In previous versions of AutoCAD materials were difficult to create, apply and render making the use of materials in AutoCAD difficult and time consuming.

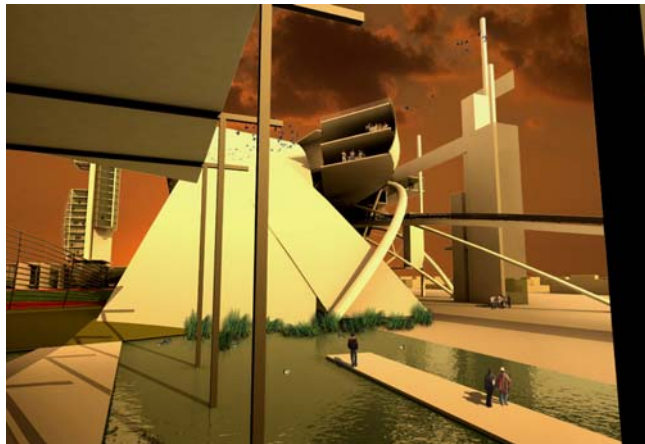
Even after the lights and materials have been properly applied, adjusting the parameters associated with a successful rendering can be a complex process. Renderings are effective tools for both investigating design alternatives and showing a client or regulatory group (such as a planning commission) the effect of the design on its surroundings. However, the technology can be so complex that many smaller organizations cannot use it effectively, and even large organizations need a dedicated specialist who focuses only on using specialized rendering tools.

### **Solution**

The new interactive light tool in AutoCAD 2007 enables users to quickly and accurately place distance, point, and spot lights in a drawing. After the light has been placed, designers can use the light target grips to shine the light precisely where they need it. By placing the lights, designers can see the effect of lights on shadows in real time, with no need to render the image first.

In AutoCAD 2007, applying materials to a model is as easy as applying hatch patterns in 2D. Users drag materials from a predefined library onto any solid face or surface defined in their model. The material then scales automatically;

there's no need to manually adjust scaling parameters based on the size of the model. If the material library does not have the proper materials, designers can use the new materials editor to edit the material and create a customized library.



AutoCAD 2007 incorporates the latest in rendering technology, the mental ray<sup>®</sup> rendering engine. This powerful technology (incorporated into other Autodesk products such as Autodesk<sup>®</sup> 3ds Max<sup>®</sup>) has been integrated into a new user interface that makes accurate and realistic renderings as easy as possible. Capabilities include a slider control that graphically displays the trade-off between time and rendering quality.

### **Benefit**

Rendering, materials, and lighting enhancements make highly accurate rendered images available for any AutoCAD user. Use these images to win contracts, meet planning requirements, or study the effects of changes on the design. Because AutoCAD 2007 focuses on ease of use and simplicity, learning time for these powerful tools is short, and the final image is both accurate and beautiful. Design professionals who use AutoCAD can now achieve these effects without hiring a special consultant or having to purchase and learn additional software tools.

# Document

After the project has been won and the design reviews completed, designers need to quickly and easily turn AutoCAD design models into clear and accurate construction documents. AutoCAD 2007 has tools that enable designers to work directly from the design model to create sections and elevations that can then be incorporated into the drawings. AutoCAD 2007 also has the powerful drafting tools introduced in AutoCAD 2005 and 2006, such as Dynamic Blocks and the Table capabilities, that make the creation of drawings productive and efficient.

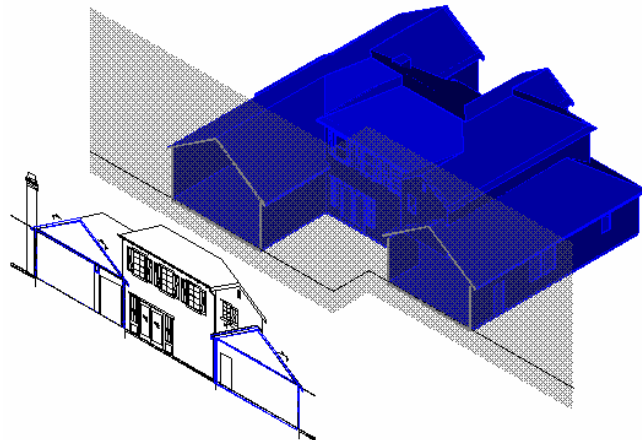
## Section and Flatten

### Problem

Once the conceptual design phase of a project has been completed, the designer needs to reuse the data from that design to drive the creation of construction documents. If the conceptual design is done using hand drawings, physical models, or a third-party software package, most of the model information must be thrown away and the drawings started from scratch.

### Solution

Use the new Section and Flatten tools In AutoCAD 2007 to quickly and easily extract drawing information from the conceptual model. The Section tool allows the movement of a dynamic, adjustable plane through the solid or surface model. Use this cutting plane to create an elevation or plan view that is ready to be dimensioned and annotated as part of the drawing creation process. Use the Flatten tool to represent the 3D model as a 2D illustration.



### Benefit

Save time and money by avoiding the need to re-create model information for construction documents. In addition, this feature helps to avoid errors caused by the manual re-creation step.

## Dynamic Blocks

### Problem

Drawings that use a great number of AutoCAD blocks can be difficult to manage and manipulate. Often, users must sift through thousands of blocks to find those that meet their needs. In addition, designers want to be able to use existing libraries easily, as well as enhance them to make them simpler to manage.

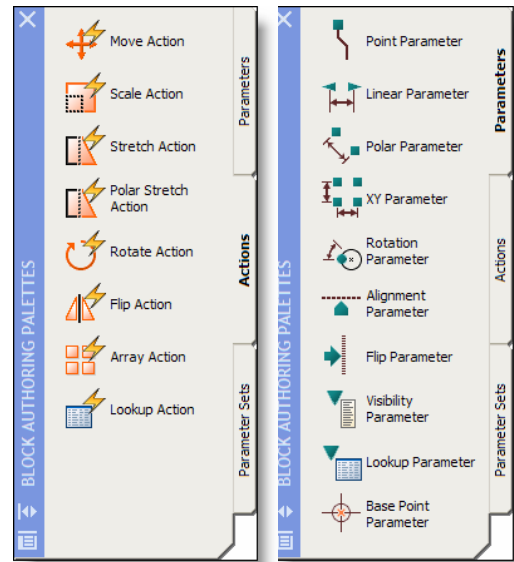
**Solution**

With AutoCAD software, blocks are *dynamic*. With the block authoring tools, designers can add dynamic behavior to existing block libraries—simplifying use of block libraries and reducing time spent manipulating blocks in a drawing.

The Dynamic Block authoring environment provides an easy, graphical way to create Dynamic Blocks from existing block libraries. It does not require any programming experience. The new Block Authoring palette enables designers to add parameters and actions by dragging them directly onto the block. To help realize the power of Dynamic Blocks, AutoCAD includes sample Dynamic Blocks with tutorials that show how to create and use them.

**Benefit**

The Dynamic Block feature makes blocks more flexible. Combining multiple blocks into a single block makes block libraries much easier to work with—saving time and increasing productivity.



**Tables**

**Problem**

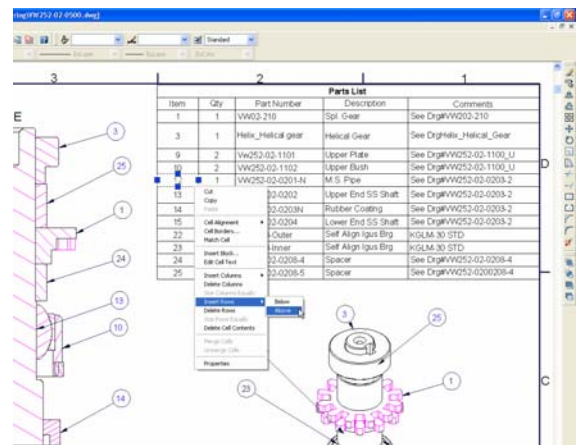
Tabular data such as lists, schedules, and legends, is fundamental to many drawings. Currently, this table data is created using basic AutoCAD objects such as lines and text. Manually creating or updating table data requires focused attention to detail as well as many time-consuming steps. In addition, the risk of error increases as the project progresses.

**Solution**

The Table command in AutoCAD 2007 streamlines the process of creating tables and controlling their properties so designers can focus on content. Predefined table styles control elements such as border properties (grid visibility, lineweight, and color), cell properties (text style, height, color alignment, and background fill), location of headings, and more. Use existing table styles to create new tables that inherit all the defined style properties. Change any property of any table element or apply a new table style in seconds.

**Benefit**

AutoCAD 2007 makes it easy to change any table property and to create table data with a variety of formatting options. Designers can easily import a table or schedule, or quickly create a new table using predefined table styles and a single command.



**Share**

As the document set is being created, or during the bidding and construction process, the extended design team must be able to share information. The entire design group can exchange DWG files, but depending on the audience and the business requirements other file and data types may be required. AutoCAD provides tools that make data exchange

simple. These include tools to export current DWG files to older versions of the DWG specification, tools for exporting and importing DWF™ files with redline and markup information, and a complete suite of flexible printing and plotting capabilities.

AutoCAD 2007 expands these powerful tools to include support for the PDF file format as well as improvements in the ability to work with DWF files.

### DWF as an Underlay

#### Problem

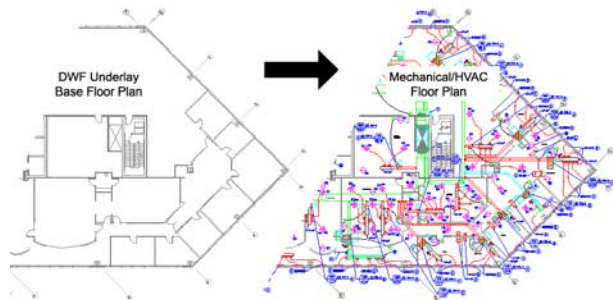
DWF technology enables designers to control their design information and protect it from accidental or intentional modification. For several releases, AutoCAD users have been able to export DWF files. For the last two releases, AutoCAD users have been able to import and export DWF files that contain redline and markup information. Although these are important capabilities, designers often want to send a DWF file to a partner or subcontractor to be used as the basis to create their own drawings.

#### Solution

AutoCAD 2007 introduces the ability to reference a DWF file as an underlay. The information can then be used as the basis for creating new drawing information, but the information in the DWF underlay cannot be altered.

#### Benefit

The use of a DWF file as an underlay enables designers to maintain the visual and data fidelity of their drawings when working with other members of their design team.



### Publishing to the Adobe PDF File Format

#### Problem

Many companies have standardized on PDF format as their corporate document viewing tool. Many government agencies also mandate submittals in PDF.

#### Solution

AutoCAD 2007 now has the ability to write drawings in the Adobe® PDF file format.

#### Benefit

Organizations no longer have to purchase a third-party application to convert DWG files to the PDF file format, thus saving money and eliminating time spent learning a new application.

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