

Autodesk®
Civil 3D®
2007

Features and Benefits

Autodesk® Civil 3D® 2007 software is a powerful, mature, civil engineering application designed to significantly increase productivity, save time, and decrease costs. It uses an industry-proven dynamic engineering model that maintains intelligent object relationships. A change made in one place instantly updates your entire project, helping you complete transportation, site, sewer, storm drain, and subdivision projects faster and more accurately. All team members work from the same consistent, up-to-date model, so they stay synchronized throughout all project phases, including survey, design, drafting, reporting, analysis, and visualization. Enhanced consulting, training, third-party developer products, and application development tools form a powerful enterprise civil engineering solution.

With Civil 3D software, your organization can standardize on one powerful product for all of its civil engineering design, drafting, and GIS needs. Reduce training and support costs, simplify licensing and subscription renewals, minimize data translation requirements, and substantially improve the quality of your deliverables with one powerful solution.

Following is a complete overview of new features and benefits in Autodesk Civil 3D 2007.

General Features and Benefits

Feature	Function	Benefits
3D dynamic engineering model	Autodesk Civil 3D 2007 software's object-oriented architecture defines each point, surface, alignment, grading, section, profile, and corridor model as an intelligent object that includes an interdependent relationship with other objects in the model. If base data such as survey observations and figures are updated, resultant points, surfaces, profiles, grading plans, road models, pipe networks, reports, tables, and finished drafting all update as well.	<ul style="list-style-type: none"> • Explore conceptual proposals and complete final designs faster. • Provide better service and value to clients. • Know for certain that a change to one part of your project has propagated throughout the project.
Project environment that enables you to share survey observations, points, surface models, alignments, profiles, and pipe networks across your project team	Autodesk Civil 3D 2007 adds multiuser project support for core elements in the Civil 3D model. Your project team can work more efficiently and with less risk of coordination errors as modifications occur in the project cycle. The project support in Civil 3D takes advantage of the core data management capabilities of Autodesk® Vault functionality to help ensure that the entire project team has access to the data that they need to complete their work. Project team members will always have the most up to date design information, and are automatically notified when there are changes made to critical components of the engineering model.	<ul style="list-style-type: none"> • Improve overall production efficiency. • Streamline production drafting. • Turn revisions around faster. • Reduce risk of errors because project team is working from a single version of the project model.
Single product for all your civil/survey needs	Civil 3D is equally well suited for any civil/survey project. Whether you are working on an urban road reconstruction projection project or new highway, development of a major industrial site, design of a new subdivision, design of a dam, airport, landfill, or golf course, Civil 3D has the tools that you need to complete your project.	<ul style="list-style-type: none"> • Reduce the time and money needed to purchase, support, learn, and maintain multiple products. • Improve process efficiency by keeping project data in a single, intelligent, dynamic environment.

Feature	Function	Benefits
Seamless integration of survey and design operations with production drafting	More than the fact that Civil 3D is built on the power and flexibility of AutoCAD® software, your productivity jumps dramatically because of the dynamic relationship between design/survey objects and resulting production drafting. No longer is drafting a separate process of creating static documentation of a design. In Civil 3D, drafting is a fundamental component of each design and survey object. The result is drafting that is generated directly from the model and that always remains in sync with the model.	<ul style="list-style-type: none"> • Streamline production drafting. • Keep up with design changes through more accurate production drafting.
Style management system	Civil 3D provides a unique style system that enables organizations to define CAD and design standards for users throughout the entire organization. Standards from the color, linetype, and increment of contours, to the labeling that appears in a section or profile band can be defined in a style that is then used throughout the design and production drafting process.	<ul style="list-style-type: none"> • Make it easier for all project team members to create accurate production drafting that conforms to submittal standards. • Enable CAD standards to be in place and easily accessed by the entire project team.

Surveying and Surface Modeling

Feature	Function	Benefits
Modern, flexible surveying solution that is fully integrated into the Civil 3D environment	Survey commands are cleanly integrated into the Civil 3D toolset and user interface. Users have a consistent environment for all tasks, ranging from fieldbook import, least squares adjustment, and editing of survey observations to management of point groups, creation of surfaces, and layout of parcels and alignments.	<ul style="list-style-type: none"> • Reduce implementation costs based on consistent use of model and interface throughout the survey, design, and production drafting processes.

Feature	Function	Benefits
Automated creation of basemaps	Civil 3D includes tools for field-to-office automation. Reduce raw data collected in the field using industry-standard surveying and GPS (global positioning system) equipment to create linework and surfaces automatically.	<ul style="list-style-type: none"> • Reduce time needed in your field-to-office process. • Minimize costly and time-consuming manual entry of field data. • Increase efficiency, so more survey projects can be completed in less time, resulting in greater profitability. • Keep a digital record of the field data for historical reference and archiving.
Use survey figures as surface modeling breaklines	Linework collected in the field, called <i>figures</i> , can be coded to be included as a breakline for surface creation. If survey observations are adjusted, figures and therefore the surface model (and downstream profiles, sections grading plans, and more) are all updated.	<ul style="list-style-type: none"> • Save time and decrease errors when creating surfaces from field data. • Keep the basemap and surfaces synchronized with latest analysis and adjustments. • Reduce drafting errors.
Point creation and manipulation	Create points that represent both existing and design features using a wide variety of tools. Then use Point Groups as a way to efficiently manage, select, and manipulate points.	<ul style="list-style-type: none"> • Use a complete set of coordinate geometry (COGO) tools to display, design, and analyze existing and proposed design features quickly and easily. • Minimize manual calculations.
Dynamic surface model creation	Create surfaces from a wide variety of 3D data, including points, contours, breaklines, external databases, corridor models, and grading objects. Once generated, the surface is used to display contours, watersheds, elevation and slope analysis, and 3D render-ready views. Surfaces can also be used as a reference for creating profiles, sections, grading plans, corridor models, and so forth. Any change to the original data can result in the surface being updated, thus updating all references downstream in the project.	<ul style="list-style-type: none"> • Create more designs in less time by taking advantage of an integrated surface model. • Reduce dependency on working with external or third-party applications to create and analyze surfaces.

Design

Feature	Function	Benefits
Parcels	Autodesk Civil 3D 2007 uses a topology to manage parcels so that a change to one parcel creates changes in neighboring parcels. Use graphical and numerically based tools to automate the initial layout, management, and editing of parcels.	<ul style="list-style-type: none"> • Dynamic relationships ensure that your parcel collection is always up-to-date. • AutoCAD grip edits and parcel editing tools simplify design changes and make the software easy to use. • Work faster than ever. • Explore more layout options to come up with the best subdivision layout and provide better service to clients.
Parcel layout	Generate parcels by converting existing AutoCAD polylines or by using flexible layout tools. Dynamic layout tools, such as slide and swing bearing, provide immediate graphical updates to parcel geometry and annotation.	<ul style="list-style-type: none"> • Use the flexible toolset to design in the way that works best for you. • Determine the best use of land to meet your clients' needs. • Reach a design solution faster with the rapid layout and adjustment of parcels.
Unique corridor modeling approach	<p>Use the Autodesk Civil 3D 2007 corridor modeling capabilities to complete all types of road, rail, and channel design projects more efficiently. This modeling approach is easy to use, yet powerful enough to handle the most complex projects.</p> <p>In Autodesk Civil 3D 2007, a road corridor combines geometric constraints (horizontal and vertical geometry) with intelligent subassemblies that define the sectional rules and characteristics of the design. The model updates when you change any of these objects. Surfaces, volumes, plotted sections, renderings, and reports all become by-products of the corridor model.</p>	<ul style="list-style-type: none"> • Save time and money with improved design efficiency. • Take advantage of software that is easy to learn, implement, and use, regardless of technical expertise. • Use the same tools and processes in projects ranging from simple to complex.

Feature	Function	Benefits
Corridor assemblies and subassemblies	Corridor modeling uses assemblies to build a design model. These assemblies contain a collection of connected subassemblies that represent real-world design components such as travel lanes, sidewalks, ditches, curbs, and retention walls. Each subassembly can contain logic that responds to changes in the design model. There is a robust library of subassemblies that ships with Civil 3D. These subassemblies range from simple sidewalks and curbs to complex lane components that include logic for road mill, overlay, superelevation, and widening projects.	<ul style="list-style-type: none"> • Adhere to standards and maintain design consistency using your own library of subassemblies and assemblies. • Quickly evaluate design decisions as the logic in the subassemblies enforces your design rules. • Create libraries for specific projects or for use throughout your organization.
Corridor modeling editing	Use powerful graphical and tabular editing capabilities to make station or regional edits to the corridor model.	<ul style="list-style-type: none"> • Meet design challenges with editing tools that are flexible and easy to use.
Alignments and profiles	Develop alignments and profiles using a variety of graphical and tabular creation commands. They also can be built using constraints that define key design controls such as the direction in which a spiral ends or the length of a curve. Alignments and profiles always remain in sync. If the alignment changes, the profile also updates.	<ul style="list-style-type: none"> • Reduce time designing and evaluating alignments and profiles that meet design constraints. • Reduce drafting time. • Dramatically reduce errors.
Grading projections	Civil 3D includes a collection of powerful day-lighting and grade projection tools that can be used to generate surface models for any type of grading project. This flexible and easy-to-use approach allows you modify groups of grading projections to quickly solve complex design problems.	<ul style="list-style-type: none"> • Quickly generate site grading that can be iterated and updated as needed, reducing errors, and streamlining the project timeline.

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Grading feature lines	Civil 3D 2007 introduces a collection of easy-to-use 3D entity manipulation tools for use in the development of any surface. Edits to polylines, 3D polylines, feature lines, parcel lines, and other 3D objects are made via tabular and graphical input and result in instant updates to surfaces.	<ul style="list-style-type: none"> • Quickly lay out, design, and edit the crucial elements in your site. • Increase grading accuracy. • Minimize errors.
Quick sections	Generate temporary sections from objects to display underlying surface conditions and the geometry of 3D feature lines. Edits to the feature line or surface changes are instantly reflected in the quick section.	<ul style="list-style-type: none"> • Quickly analyze existing condition to make design decisions faster and more accurately. • Quickly iterate through design alternatives.
Pipe layout	Lay out sanitary and storm drainage systems as rules-based, dynamic, interactive networks. Make changes to pipes and structures using graphical and numeric input. All pipes are completely integrated with the rest of the Autodesk Civil 3D model.	<ul style="list-style-type: none"> • An easy-to-use process that is well integrated into the Autodesk Civil 3D user interface helps to keep you focused on your design. • The interactive model enables you to begin working immediately with the new pipe capabilities. • Dynamic interaction between all aspects of the model increases productivity. • All aspects of the design remain in sync, reducing the risk of design errors.
Accessibility of pipe data for use in analysis applications	Share pipe network information, such as material and size, with analysis applications. Data such as pipe size, material, slope, and so forth, can all be exported from Civil 3D, or use standard Microsoft® Windows® Cut and Paste operations to copy data into spreadsheets and documents.	<ul style="list-style-type: none"> • Integrate your design proposal with analysis applications that you're already using.

Production Drafting

Feature	Function	Benefits
Automated production drafting directly from Civil 3D model	Civil 3D automatically generates commonly required production drafting and reporting elements such as fully annotated section sheets, profiles, profile details, grading plans, and more. The style-based drafting environment in Civil 3D helps to automate the creation of typical drafting while also helping ensure that drafting standards are being maintained. The result is an integrated process where finished drafting is directly extracted from the design model and always remains in sync with the model.	<ul style="list-style-type: none"> • Reduce the overall project timeline by decreasing the amount of manual drafting. • Decrease errors and omissions that can occur between the design and the drafting stages. • Enforce company and client standards.
Labels and tables	Autodesk Civil 3D 2007 generates labels based on styles that control the content and appearance of the label. The software derives label data directly from the object that is labeled and dynamically updates labels based on changes to the labeled objects.	<ul style="list-style-type: none"> • Save time throughout all phases of the drafting process. • Define standards for label and table values and appearance for use throughout the organization. • Maintain accurate annotation, generated directly from design objects.
Label display	Labels automatically respond to changes in drawing scale and view orientation—even when used as external references (xrefs). For example, if you rotate or change the plot scale of your drawing within different viewports, all labels update instantly.	<ul style="list-style-type: none"> • You don't need to redraft labeling to match plot rotation and scaling, saving time and improving efficiency.
Reports	Autodesk Civil 3D 2007 provides flexible, real-time, and extensible report generation directly in the product. Data is derived directly from the Civil 3D model, resulting in a real-time view of the design model.	<ul style="list-style-type: none"> • Create reports faster than ever. • Flexibly match report format standards.
COM API (application programming interface)	Autodesk Civil 3D 2007 includes a powerful COM API for creating and querying civil data such as surfaces, points, alignments, parcels, profiles, the corridor model, and more. This interface is well suited for both third-party and in-house developers who want to extend the capabilities of the software to meet local requirements or to add incremental capabilities.	<ul style="list-style-type: none"> • Develop a more efficient process by expanding Autodesk Civil 3D 2007 to meet your specific needs. • Use third-party add-on applications as they become available.

Feature	Function	Benefits
Visualization	Civil 3D includes rendering capabilities right out of the box. Apply render materials to your site, road, pipe network, and renderings. Animations are just a click away.	<ul style="list-style-type: none"> • Show your clients exactly what the finished design will look like. • Renderings are created from the Civil 3D model directly in Civil 3D. No data conversion required and no separate rendering application to learn and support.

Data Interoperability

Feature	Function	Benefits
AutoCAD DWG environment	Built on the AutoCAD® 2007 foundation, Autodesk Civil 3D 2007 provides a native DWG environment.	<ul style="list-style-type: none"> • Read DWG format files from any vendor or partner, or any files that are stored in legacy format. • Easily share DWG files created in Autodesk Civil 3D 2007. The software includes an object enabler to ensure that you can manipulate Autodesk Civil 3D objects in any AutoCAD 2007–based application.
Autodesk® Land Desktop project	A tremendous amount of design and project data exists in the Autodesk Land Desktop project format. This includes data such as alignments, profiles, parcels, points, and surface models. Autodesk Civil 3D 2007 can import and export any such data that may be archived or needed for submittal on a project.	<ul style="list-style-type: none"> • Save time by reusing archived project data. • Easily share data with other vendors who require submittal of Autodesk Land Desktop project data.
LandXML	Autodesk Civil 3D 2007 can import and export LandXML data—a common, industry-accepted data format for sharing and archiving civil and survey data such as alignments, profiles, parcels, points, surface models, and more.	<ul style="list-style-type: none"> • Greatly reduce the time and effort needed to share design data with vendors who are using complementary or alternative software products. • Move your design data into an open format, where it can be used in new ways.
MicroStation® DGN	Autodesk Civil 3D 2007 reads and writes MicroStation DGN format files.	<ul style="list-style-type: none"> • Save steps and reduce errors through an integrated DGN import/export capability that is built into Autodesk Civil 3D 2007.

<p>Other data formats</p>	<p>Autodesk Civil 3D contains a variety of import/export utilities that can be used to work with point files, GIS data sources, other CAD formats, and generic ASCII data. You can also generate 3D Autodesk® DWF™ files for use on the web or for mass communication.</p>	<ul style="list-style-type: none"> • Save time and money by using preexisting data (as opposed to manually digitizing or re-creating this data). The 3D DWF format enables viewers to rotate their view in 3D to more clearly understand the details of the model.
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AutoCAD Foundation

Feature	Function	Benefits
<p>AutoCAD feature set</p>	<p>Use all AutoCAD 2007 commands in Autodesk Civil 3D 2007.</p>	<ul style="list-style-type: none"> • Gain the cost and usage efficiency that comes with an integrated, unified design and drafting system.
<p>Autodesk Map® 3D feature set</p>	<p>Autodesk Civil 3D 2007 includes all Autodesk Map 3D functionality, such as import/export, drawing cleanup, plot sets, and GIS analysis and inquiry functions.</p>	<ul style="list-style-type: none"> • Make better use of spatial data and GIS data sources throughout the design process.
<p>Integration with AutoCAD-based processes</p>	<p>Because of the AutoCAD foundation in Civil 3D 2007, you can continue to use the plotting, file sharing, archival, drafting standards, other third-party products, and any other processes set up for the AutoCAD environment.</p>	<ul style="list-style-type: none"> • Streamline adoption and shorten learning time. • Reduce cost of deployment.

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