

General

- **CAD Platforms** : Runs in AutoCAD versions 2009 to 2000 as well as AutoCAD Map, Land Desktop and Civil3D, with added support for running on IntelliCAD 6.4
- **Project Setup**: Flexible data storage methods
- **Drawing Cleanup**: Fix common drafting errors
- **Drafting Enhancements**: Handy tools for working in AutoCAD such as Join Nearest, Shrinkwrap Entities, Polyline Utilities, Drawing Inspector, Layer Inspector and Twist Screen
- **Data Compatibility**: Supports industry standard LandXML and scores of specific data conversions

3D Data

- **Elevate 2D to 3D**: For spot elevation, polylines, contours and pads
- **Edit-Assign Polyline Elevations**: Elevates 3D polylines using control points
- **Create Ridge Polylines From Contours**: Creates 3D polylines for ridges, valleys and summits to enhance surface from contours
- **3D Polyline Tools**: Draw, offset, fillet and merge 3D polylines

Surfaces

- **Build Surfaces**: By triangulation or rectangular grids
- **Contouring**: One step triangulate and contour from 3D entities as well as contouring from surface files
- **Triangulation Utilities**: TIN math (add, subtract, multiply, divide) by value or another TIN within perimeters, and offset, simplify and merge functions
- **Surface Manager**: Change surface display properties and adjust surface functions to add and remove points and breaklines and swap edges
- **Surface Inspector**: Real-time elevation feedback while moving over surfaces
- **3D Surface Flyover**: 3D viewer with vehicle to drive over surface or follow 3D path
- **Slope Analysis**: Label and report surface slopes at selected points and slope zone analysis

Grading

- **Volumes**: Earthwork volumes between triangulation or grid surfaces
- **Pad Design**: Tie cut/fill slopes from pad perimeter to surface, build pad surface, calculate and balance volumes, and edit pad parameters
- **Cut/Fill Color Maps and Labels**: Draw shaded map of red/blue and flexible labels for cut/fill and surface elevations
- **Cut/Fill Centroid Analysis**: Outlines perimeter and finds center of mass for each cut/fill area with option to report optimized earthwork movement
- **Earthwork and Material Quantities**: Volumes adjusted by subgrade zones and material quantities for count, length, area and volume by entity layer
- **Story Stakes**: Create different styles of story stake reports



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Key Features of Carlson Civil 2009 – Continued

Centerlines

- **Design and Edit Centerlines:** Design or input alignments on screen or in dialog with graphics
- **Label Stations and Offsets:** Annotate station and offsets along centerline and at selected points
- **Calculate Offsets:** Reports stations and offsets for selected points along centerline
- **Create Offset Points:** Create points at specified stations and offsets
- **Spirals:** Flexible handling of the most complex spiral curves including “spiral-only” elements going arc-spiral-arc, arc-spiral-line and line-spiral-line

Profiles

- **Create Profiles:** From surfaces, screen entities, points on centerline, etc
- **Quick Profile:** One step profile creation with real-time update while adjusting centerline
- **Input-Edit Profiles:** Enter profile data in dual spreadsheet and graphic window, and design in reference to controlling profile grade points
- **Draw Profiles:** Draws profiles on grids or plan-profile sheets with auto-updating based on edits
- **Design Road Profile:** Create road profile on profile grid or spreadsheet with simultaneous profile, plan and section views
- **Design Sewer/Pipe Profile:** Create profiles with invert elevations, pipe sizes, rim elevations and manhole sizes
- **Profiles To 3D:** Create points and 3D polylines from profiles
- **Profile Reports:** Several report functions such as Sag/Crest for roads and Pipe Depth Summary for trenches

Sections

- **Create Sections:** From surfaces, screen entities, points, etc
- **Quick Sections:** One step creation of sections
- **Draw Sections:** Draw sections in vertical stack or on standard, logo-based sheets with flexible formatting and auto-updating based on edits
- **Input-Edit Sections:** Enter section data in dual spreadsheet and graphic window with drive-thru function
- **Sections to 3D:** Create points and 3D polylines from sections, with optional influence of profile, an essential process for creating DTMs for machine control on most highway projects, where sections “govern”
- **Mass Haul Diagrams and Analysis:** Calculate and draw mass haul diagrams and routine to report optimized earth movement by distance ranges
- **Section Volumes:** Calculates volumes between two section surfaces by end areas method

Road Design

- **Template Design and Drawing:** Detailed yet simple template design with unlimited subgrades, rule-based cut, fill and superelevation methods and routine to easily draw typical template
- **Template Transitions:** Define transitions for templates, superelevation, topsoil with control over each template grade line using 2 methods: lane width change by station range or “string” method where template IDs follow defined alignments
- **Process Road Design:** Applies road design, reports quantities and outputs sections, surfaces and template points
- **Road Network:** Dynamic road design with intersections and cul-de-sacs
- **Road Design Inspector:** Real-time viewing of road design in plan, profile and section views



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Key Features of Carlson Civil 2009 – Continued

Points

- **Import/Export:** User-defined import and export of point data along with conversions with specific other formats
- **Draw Points:** Draw points with settings for symbols, layers and styles
- **Point Groups:** Point group manager to define sets of point by filters
- **Coordinate File History:** Tracks all changes to points with report and undo functions
- **Fix Point Label Overlaps:** Finds point label overlaps with rule options to fix automatically
- **Point Tools:** Utilities for modify point labels such as move with leader, twist and resize

Area/Layout

- **Label Areas:** Customized area label styles and several methods to select areas to label
- **Size Areas:** Sliding side area, hinged area, area radial from curve and bearing area cutoff
- **Lot Manager:** Lot definitions by point numbers with functions to create lots, conduct mapcheck for closure, edit in spreadsheet with graphics, report lots and draw lots
- **Lot Layout:** Size lots along alignment with controls for target area, setback and frontage
- **Offsets, Intersection and Cul-de-Sacs:** Layout for ROW and EOP linework

Annotation

- **Angle & Distance Labels:** Flexible routines to label linework in all possible layout combinations plus available rules to automatically fix label overlaps and revise labels when entities move
- **Curve Labels:** Label curve data in stack, along arc or in table
- **Survey Text:** Routines to create typical plat labels such as offset and building dimensions
- **Label Elevations:** Label spot elevations along an alignment
- **Linetypes:** Draw special linetypes

Companion Programs

- **Carlson SurvCE:** Data collection for Windows CE and Pocket PC
- **Carlson Field:** Take Carlson and AutoCAD to the field for data collection and stakeout with total stations and GPS
- **Carlson Takeoff:** Construction Estimating for earthworks, subgrades, material quantities, strata quantities and trench networks
- **Carlson Point Clouds:** Process laser scan data to generate models, breaklines and points
- **Carlson Natural Regrade:** Design stable land surfaces that follow natural hydrologic and geomorphology principles
- **Carlson Geology:** Models drillholes and strata structures and attributes



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