

Carlson 2027 Release Notes

General Improvements

- **IntelliCAD 14.1 Support:** Supports the latest IntelliCAD release while providing IntelliCAD 13.1 for legacy compatibility.
- **AutoCAD 2027 Support:** Fully supports the newest AutoCAD release.
- **Label Style Library:** Introduced a comprehensive Label Style Library and a dedicated UI Editor.
 - **Label Style Capture:** Added a "Capture Style" button to the Label Style Library Editor for rapid style replication.
- **Enhanced Tables:** Extended table creation to support native CAD TABLE objects, including cell merging, font/cell sizing, and improved sizing for SWRTBL.
- **OpenGL Rendering:** Implemented a render object in the OpenGL view to keep text objects fixed and legible during high-level zooming.
- **IntelliCAD-only Improvements:**
 - **GeoPDF:** Geolocation information can now be exported via PDF export and Publish routines (IntelliCAD-only).
 - **DGN Fallbacks:** Implemented an automatic fallback to LWPOLYLINE for complex string entities when in DGN mode.
 - **Remove Dead Data Links:** Support for this OLE data clean up function is now extended to IntelliCAD as well.
- **Improved Error Handling:** Errors during Lisp command execution now report stack and line information via a call to (vt-bt) to accelerate troubleshooting.
- **Additional UI Controls:**
 - Added a "Use Mtext" option for labeling elevations along polylines.
 - New ANNFLIP capability to flip text attributes within blocks.
 - Variable offset functions added to the 2D library..
- Added the "**Carlson Support Page**" Assistant available through webview and CAD, providing a natural language interface for documentation.
- Added more options to **Drawing Cleanup** for detecting and removing problematic entities such as dead data links, proxy objects, duplicate block references and added the ability to save and load Drawing Cleanup settings and apply to multiple drawings through a batch process.
- **Civil 3D Interop:**
 - Enhanced **Carlson-to-Civil 3D** conversion to support special Layer 0 attributes, hidden descriptions, elevation prefix/suffix, and point label rotation/offset.
 - Point group and range exports now include non-drawn points.
 - Added the ability to select drawings/templates containing Civil 3D styles for export and set a default template in **Export Carlson to Civil 3D** and Improved routine for points to preserve original point precision, location and rotation of attributes.

Survey & Cogo

- Added support for **SPCS 2022** geographic-to-grid transformations and SPCS 2022 geoid elevation transformations.
- Added support for "USA Amtrak/NAD83(2011)/Amtrak ANECCS" and "USA Amtrak/NATRF2022/Amtrak ANECCS" projection systems.
- **Point Group Management:** Added a "Set From Description List" button for point groups and enabled direct point group creation from FLD and TXT files.
- **CFUTRANSFORM:** Reworked grid-to-grid coordinate transformations for significant performance gains on large entity sets using multi-threaded processing.
- **SurvNET:**
 - **Reporting:** Improved unadjusted and adjusted vector reports; added vertical closure summaries for differential and trig levels, elevation standard deviations to sideshot reports, and Chi-Square test results to the Vertical Adjustment Report.
 - **Terminology Update:** ALTA/Relative Error Ellipse Reports are now renamed to RPP (Relative Positional Precision).
 - **Control Points Management:** Added the ability to directly view SurvNET project Control Points.
 - **Multiple JDB Support:** Added processing for multiple JDB files within a single project and integrated JDB editor functionality.
 - **Vertical Control Toggle:** Added a checkbox in SurvNET Project Settings to toggle BM records in TLV files as vertical control points.
 - Added the addition of Vectors to the total station **mark-to-mark distance** section of grouped unadjusted observations, updated **2D/1D Vertical Adjustment Reports** in to display benchmark changes resulting from vertical adjustments.
- **Deed Reader Improvements:**
 - **PDF Import:** Improved the statistical model for Online Text Recognition and implemented a progress dialog with enhanced responsiveness.
 - **Error Handling:** Improved error handling for online text recognition, including automatic failover to offline recognition and initial implementation of Online Typo Correction.
- **Legal Descriptions:** Improved the logic of non-breaking spaces (MTEXT) for bearing strings to facilitate proper formatting.
- **Editing Multiple Points:** Added a new Spreadsheet Editor to the MODPNTS routine with the ability to select and edit multiple cells.
- **Line/Curve Table Improvements:**
 - Refined duplicate reference label prompts to trigger only during LINETBL and CURVETBL commands.
 - **Command Additions:** New RELINK_LABELS command for better annotation management following linework modifications.
 - **Advanced Table Options:**

- Improved processing speed for Line/Curve tables (8x faster).
 - Added a "Curve Data In Single Cell" option and "Autosize After Table Editing" setting.
 - Added a "Use Native Table Entity" setting to control table placement types.
- **Area Tables:** Added automatic sorting when adding or updating area labels.
- **Legend Overhaul:** Revamped the "Draw Legend" dialog with better logic and the ability to recognize an entity's layer during selection.
- **Station Polyline/Centerline Enhancements:**
 - Enabled labeling for compound/reverse curves and added Northing/Easting coordinate ordering for deflection angles.
 - Added User-Defined Stations (UDS) export and the new EDIT_USER_STATIONS command.
 - Improved tick labels to prevent overlap from larger tick marks.
- **LotNet Improvements:**
 - **Corner Handling:** Radius support for rounded setback corners in Lot Setback Polyline and Building Placement.
 - **Linework Cleanup:** Deleting LotNET entities now erases all associated lot edges.
 - Added command to create lots from picking and interior point
- **Freeze/Thaw Points Improvements:**
 - **Leader Support:** "Freeze Points" now includes associated leaders from Move Point with Leader.
 - **UI Additions:** Added coordinate file selection for FREEZEPT and a new dialog for THAWPT.
- **Visual Enhancements:** The default ByLayer color of the Barscale has been changed from red (1) to white (7).
- **Unit and Projection Support:**
 - **2DP/3DP:** The distance prompt now dynamically supports US Survey and International feet based on drawing settings.
 - **South Africa Projections:** Added support for Hartebeesthoek94 and Cape datum projection systems.
 - **Predefined Systems:** Added UTM/NAD83(2011) projection systems.
 - **Geoids:** Enabled dynamic lookup via the GeoidGrid service, including SPC 2022 geoids.
- Added detection and user warning when erroneous projection systems are detected upon opening a drawing.
- Enabled performance improvements and refined annotative scale functionality.
- Added ability to organize deeds within the **Process Deed** dialog box.
- The **"New Table"** button in AUTOANN now permits editing both line and curve prefixes in combined tables mode.
- Updated point table outputs to include point notes.
- Added a toggle to Calculate Offset Settings to include Geodetic Report data (Latitude/Longitude in DMS and Decimal Degrees) in Report Formatter options.

Civil Module

- **Road Network:**
 - **Road Network Intelligence:** Automatically detects the side of a template point centerline relative to the main road during addition.
 - **Intersection Modeling:** Intersections now support custom centerlines/polylines for pavement edges and include additional breaklines for realistic triangulation.
 - **Template Depth:** Users can now specify preferred minimum cut and fill depths within Road Templates.
 - **Dynamic Conversions:**
 - The Template Editor now automatically converts Curb, Sidewalk, and Subgrade values when switching units.
 - Centerline files not originally in the drawing can now be converted to Civil 3D format.
 - **Management:** Added Import/Export for "Special Stations" via .uds files and the ability to load drawing templates from network or specific paths.
 - **Solid Model Performance:** Improved performance when repeatedly loading and saving Road Network models.
 - **Subgrade Library:** Added a new Subgrade ID Library
 - Improved coloring for non-winged curb ramps following triangulation.
- **Parking Network:**
 - **Intersection of Parking Centerlines:** Added control for corner treatments within the Intersection tab.
 - **Improved Interface:** Enabling controls with relevance based on type of Parking Network centerline selected in the tree.
- **Design Pad/Edit Pad:**
 - **REPAD Consistency:** Added missing parameters to synchronize redesign results with original settings. Volume Calculations now update on "Process"
 - **Modern Contouring:** Integrated standard contouring options and dialogs into pad routines.
 - **Merging Logic:** Improved logic for merging multiple pads with existing ground.
 - **Slope Treatment:** Improved slope conditions when constrained by walls or perimeters.
 - **Slope Lines:** Added additional customization features to slope lines output by pad (three/four line, arrows, zigzag)
 - **TIN output:** Added ability to output only the pads as TIN's when processing multiple pads
 - **Interior Surface:** Improved the linework for pads with interior surfaces
 - **New REPAD routines:** Reports using the Report Formatter, contour pad, draw slope lines, Merge TIN
- **Centerline Editor Enhancements:**

- **Radius Calculation:** Introduced a new function to calculate curve radius from delta angle and arc length.
- **Precision Retention:** Improved precision maintenance between calculated and display data; curves are only recalculated upon user value changes.
- Centerline **Imports from Civil 3D** now support spirals and validate data for complex spirals.
- **Quick Sections Power Ups:**
 - Synchronized functionality with "Draw Section Alignment".
 - Added ability to save MXS files and directly calculate section volume.
 - Added perimeter polyline offset computation for section files and extra stations for sections.
- **Draw Profile Improvements:**
 - **UX Confirmations:** Added a "Remember This Choice" toggle for Erase Profile and Load Settings prompts.
 - **Vertical Curve Labels:** New control over label placement (label box, on profile, or both).
 - **Horizontal Label Boxes:** Automatic title box width calculation, new "Draw Label Underscores To Profile" option to place label leader offsets in the grid.
 - **Label Scale:** Added auto-place on profile option.
 - Added support for editing mixed profiles containing both vertical and circular curves in Profile Editor and ROADPRO.
 - Added a Radius column to road profile reports and added mixed profile support to PREPORT.
 - Added "Increment Elevation Text from Beginning Elevation" toggle.
 - Added a column displaying horizontal curve length for Circular vertical curves.
 - Enabled importing and exporting mixed profiles containing vertical and circular curves in LandXML.
 - Fixed "Vertical Line" toggle enablement, added Above/Below Profile options for label placement, and added new PVC/PVT/PVI text locations.
 - Added an informational column in both PROFEDIT (Road and Circular modes) and ROADPRO to display Point of Intersection (PI) Types based on vertical curve and radius values.
- **Draw Section Improvements:**
 - **UI Upgrade:** Upgraded for consistency with Draw Profile, including "Reset Settings".
 - **Section Type:** Added a new station type to Section Profile Settings and Draw Section dialogs.
 - **Alignment Logic:** Improved maximum distance logic for section alignment to perimeter polylines.
 - **RSECTION Command:** New command for Section Capture with diagram data reading capabilities.
 - breakpoint elevation, offset, and description labels.
 - Added more options for displaying section file and centerline names.

- Added a setting in Draw Sections to place "Label Section File Name" at the first section of each row/column or all sections.
 - The "Interpolate" routine in **Section File Editor** now maintains subgrades when "Use Offset Description" is enabled.
 - **Extended IFC & Solid Support:**
 - **Properties Inspection:** Added loading for dynamic IFC properties in the Drawing Inspector and Properties window.
 - **IFC2DWG Extensions:** Added multi-file selection, SubD mesh drawing, and case-insensitive material property conversion.
 - **SOLID_PERIM:** Extended command to compute top and bottom outlines as polylines.
 - **Shape Selection:** Improved inverted shape selections in MDL and IFC.
 - **Station-Offset Labeling:**
 - Supports viewing elevations in the label preview tooltip when referencing Road Networks.
 - Automatically uses existing surface elevations for undefined points while referencing Road Networks.
 - **Plan View Grids:** Added options for interior/perimeter ticks and improved text placement and offset logic.
 - **Polyline Elevation Editing:** Implemented polyline reordering logic in the Polyline Elevation Editor routine.
 - **Contour Labeling:** Added "Above/Below" placement options and compatibility for "Draw Box Around Label" regardless of placement.
 - Improved the **Contour from Grid** routine to create closed contours as entities with closed polyline property
 - **Profile to Points:** Added End Station control.
 - **UI & Productivity:**
 - **Tooltips:** Added network path tooltips for Road, Parking, Tunnel, and LotNET.
 - **Focus & Resizing:** Road, Lot, and Parking Networks now return focus to CAD upon closing and feature resizable trees.
 - **Section Editor:** Updated to display shortened file names with tooltips.
 - Improved controls for horizontal elevation labels .
 - Improved station identification and enhanced grid detection in Section Capture.
 - Improved the **Trench quantity report**.
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Hydrology

- **Sewer Line Logic:** Implemented "Trunk" vs. "Tributary" line; Added the ability to define separate starting stations for Trunk and Tributary lines; Added a command to reset the Trunk Line while keep the rest as the Tributary lines; Added a command to reset the line name; Added plan view control on selected lines; Removed line name support for trench and F2F sewer plan views where not applicable.

- **Annotation Styles:** Implemented automatic naming of sewer structures based on Line name and index; Introduced a new junction annotation style that includes trunk and tributary line names and stations in the junction labels for both plan and profile; Added a setting to increment manhole stations by rounded pipe lengths.
- Improved options for labeling, reporting and stationing sewer profiles.
- **Interactive Analysis:**
 - Added active rainfall ID and return period tracking in the spreadsheet editor, allowing for real-time HGL updates in OpenGL view.
 - Added Catchment Area (CA) and Accumulated CA to the editor.
 - Added file modification dates to the Sewer Inspector.
 - Added detection and warning messages when pond sizing inputs fall outside recommended sizing ranges.
 - Improved sewer data handling during LandXML import and export.
 - Added detection for duplicate line names to the **Add Tributary Line** routine.
- **Lateral Improvements:** Cleanout labels and partner blocks now reference distance from the downstream structure rather than station.
- **Dynamic Editing:** Added a prompt to edit the upstream pipe after its downstream pipe has been grip-adjusted in profile.
- **F2F Pipe Warning:** Added a warning to FLD2FIN Pipe Processing to prevent accidental parameter overrides by append description special codes.
- **Sewer Profile Inspector:** Added profile/sewer link type and improved slope accuracy by using original pipe slope settings.
- **Plan View Settings:** Added a prompt to confirm saving settings to the .pvl file upon exiting the dialog.
- **Cleanup Function:** Automatically removes unused sewer-profile links from the drawing dictionary.
- **Naming Automation:** Improved auto-naming support for sewer lines with varying names.
- **Draw Sewer Profile:**
 - **Link Profile:** Improved "Off, Draw Only" option and dictionary saving.
 - **Preview:** Updated profile preview to show actual pipe material labels.
 - **Manhole Labels:** Added horizontal offset options.
 - **Station Style:** Refined horizontal label box logic based on grid selection.
- **Soil Download:** Supports non-natural soil classifications (e.g., water, urban land).
- **Detention Pond Design:** Stored Culvert tailwater condition data and culvert design control type in the pond file; Increased the decimal precision for the C factor and CN values.
- **User Experience:**
 - Added an error message for calculation failures when drainage data is missing.
 - Ghosted the starting station input field when no tributary line exists.
- Importing sewer networks from 3D polylines automatically sets trunk outfalls and improves outfall selection prompts for tributary lines.
- Added additional options and more control for designing sewer trunk lines

- Improved sewer spreadsheet editor for displaying structure name prefixes to indicate structure types.
 - Improved dynamic editing of sewer profiles maintaining properties (layer, linetype, color) directly from the sewer profile dictionary.
 - Improved conversion of **Civil 3D pipe networks to Carlson** sewer files (.sew) during Civil 3D Pipe Import.
 - Added a settings report for global and channel settings in **GeoFluv**.
 - Improved options to export sewer networks to points.
 - Added an option in sewer plan view to connect headwall symbols to pipes at the inner wall.
 - Added more options to sewer structure reports.
 - Added support for the hectare area unit in Pond Design and updated runoff C-factor and curve number computations.
 - Added **C-factor** adjustment features for higher return period storms in Pond Design & HydroNet and updated calculations and reports.
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Site Design & Takeoff

- **Takeoff Targets:**
 - Adopted "Initial/Final" surface terminology for consistency.
 - Added options for user-defined surfaces or non-surface exclusion zones in layer setup.
 - Warning prompts now display specific target names when data changes.
- **Surface Timeline:** The 3D Surface History/Viewer is available via `tk_gridstep`, auto-populated with Takeoff surface data and restored by "Reset to Default".
- **Centroid Accuracy:** Enhanced the calculation algorithm for Cut & Fill Centroids to better represent the physical center of piles.
- **Classification Panel:** Enabled double-clicking to edit cells in the ID and Name columns.
- Added "Linework Options" to import vectorized text as individual characters, lines, or paragraphs during **PDF import**.
 - Added "Vectorize and Insert" Preprocessing Options controls (Halftone vs. Black & White).
- Improved Mtext matching when converting doubles composed of individual Text/MText entities in ENTITIES2TEXT.

GIS & Data Exchange

- **ArcGIS Services:** Added a "Validate Service Certificates" toggle to allow bypassing verification for internal networks.
 - **SQLite/Spatialite:** Supports writing NULL values to SQLite databases and provides notifications for missing primary keys during export.
 - **Monument Data:** Added monument data to point notes when importing via ePlan or LandXML monument types.
 - **GEODB Import :** Added support for the "Use Attribute Layer" option.
 - **Usability:** Added warnings for non-standard PT_ID attribute definitions in GIS files.
 - Restored support for JPEG image output in **Convert MrSID Images**.
 - Added warning messages for entity and feature type mismatches in **GIS Assign Attributes & Data Editor**.
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Point Cloud

- **Project Naming:** Default project names now use the current drawing name.
- **Visual COGO:** Initial implementation of "PCM Visual COGO" for advanced spatial analysis testing.
- **Feature Extraction:**
 - Added a "Smooth" algorithm toggle for parking/paint line extraction to eliminate bumpiness.
 - Updated the algorithm to distinguish parking lines from curb lines.
 - Added pavement and concrete extraction routines
- **UI & Productivity:**
 - Implemented multi-select and improved right-click compatibility in the Project Page tree.
 - Added intelligent point numbering that checks for CAD conflicts.
 - Updated "draw to CAD" settings are now accessible via right-click.
 - Prevents accidental selection changes from arrow/shift key inputs.
 - Improved error messaging for save failures, including low disk space notifications.
 - All file path text is now auto-formatted/auto-sized to fill the text's allocated dialog space completely.
- **Base Product Functionality:** The Align/Register routine is now available in the Point Cloud Basic product level.
- **Feature Completion - Linework Control:** New control to choose whether to draw linework in 2D, 3D, or both.
- **EPSG Based Transformations:** Accelerated transformations that involve EPSG codes.

- **Added Preview for the Next Generation Point Cloud Engine:**
 - "PC_ENGINE" command toggles the engine or the engine can be set in the project settings
 - Improved user feedback for errors and progress as well as improvements to existing Point Cloud routines and performance.
 - Importing point clouds now provides **CRF transformation** options via the "Change Projection" routine.
 - Rendered Scene Folder directly below Cloud Folder in tree controls, prevented View Solid from defaulting to "Append to Existing", and added "Close Gaps" options for Poisson and SSSR solid routines.
 - Improved the Solid Creation Method dialog interface.
 - Reordered controls in "**Feature Extraction Settings**" to align with standard design workflows (Gutter → Top of Curb → Back of Curb).
 - Added polyline activation highlighting and introduced Show/Hide Selection routines in PolylineFolder and PolylineItem context menus.
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Mining & Geology

- **PitMaster:**
 - **Ramps:** Major ramp overhaul supporting "Allow Superelevation," minimum turning radii, and improved entrance angles.
 - **Bench Management:**
 - Added option to exclude previous bench points from next-bench seed polylines.
 - Ramps now support 3D polyline benches and refined starting point notches.
 - **Slope Groups:** Added support for slope groups with variable bench widths and face angles; reworked tapering and toe line generation.
 - **Layer Control:** Option to prefix output layers with the pit name.
- **Database Performance:** Significant performance improvements for SQL Server ODBC drillhole functions (Import, Edit, etc.).
- **Pit Timing:** Improved 3D Pick feature for multi-unit progress tracking across different rates and completion dates.
- **Faults:** Fault polyline editing is now non-destructive, allowing for the preservation and dynamic updating of Xdata.
- **MTNTOP Improvements:**
 - Lists autorun overall constraints in reports and adds total runtime output.
 - Added overall surface to pit volume reporting independent of strata volumes.
- Added an option in "Add Attribute" during Drillhole Import to define attribute types as string attributes.
- Added a "Clear" button, configured column auto-resizing based on content, and organized import options in Import Drillhole.
- Added TrueColor support for mine timing hatch commands.

- Added "Thickness (in)" keyword to the reserved attributes list for equipment timing.
 - Improved grid layer polylines in GEOCOL for better color control
 - Added an option to create/load pattern files directly from edit menu, improved hatch options, and enhanced menu readability in Strata Isopach Autorun.
 - Increased decimal precision for contour interval settings in Isopach Autorun.
 - Added an option for zero bench width in Pitmaster.
 - Added grouping logic to Define Grade Parameters and introduced options for manual expression entry versus spreadsheet entry.
 - Converted the parameter setup dialog in Define Grade Parameters to a spreadsheet format.
 - **Solids Improvements:**
 - Extended SOLID_PERIM to export top and bottom surfaces.
 - Improved reliability for shell orientation, baseline elevations for holes, and validation of unconnected shapes.
 - Improved processing speed and accuracy for solid trimming operations.
 - Added a new command to generate solids from two TIN surfaces.
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Natural Regrade

- Added options in gfRegrade to toggle colored highlighting and channel name/drainage density annotations that update dynamically with parameter and polyline adjustments.
- Added slope format options to global settings in GeoFluv and updated settings to commit changes only upon clicking OK .