Improvements for Carlson Office 2017 [DRAFT]

Highlights
- **IntelliCAD 8.2** – New 3D Solids module. New commands. Improved performance. Native DGN with basic CAD functions.
- **Reports** – Improved reporting especially for Takeoff and Hydrology as well as general Report Formatter.
- **Carlson Community** – For sharing point symbols, 3D models and other files with Carlson Software users.
- **Field-to-Finish** – Lots of new features based on user requests.
- **GIS for points** – New ability to store GIS data in the CRDB coordinate file to make GIS for point much easier.
- **3D Solids** – New routines to use 3D Solids for profiles and cross sections as well as new 3D viewing for solids.

General
- **AutoCAD 2017** – Added support for this new version.
- **IntelliCAD 8.2** – Added new Solids module with commands to create and process solids. Set paper size for new layouts. MText in-place editor. 3DORBIT. Customize for toolbars and ribbon. Work with DGN files natively without conversion and do basic CAD edits. Performance improvements.
- **LandXML** – Added support for LandXML 2.0 to output TIN surfaces with colors and materials. Added support for import of linework (plan view features).
- **Startup Wizard** – Added method to select dwt for new drawings.
- **Merge PDF Files** – New command to combine PDF files to make master PDF report.
- **Output Layouts to PDF** – New command to create a PDF from selected drawing layouts.
- **Drawing Explorer** – Added right-click functions to zoom and pan to selected data files.
- **Change Layer Color** – New command to change the color for a layer by selecting an entity on the layer.
- **Google Earth File Export** – Added control for which point attribute to use as marker.
- **3D Solid and Polymesh Converter** – New command to convert solids and polymesh entities into 3D Faces.
- **3D Model to Solid** – New command to convert .mdl files to 3D solid entities.
- **3D Arc** – New command to draw a 3D arc by three points.
- **Draw 2D/3D Polyline** – Added option to draw smooth curves on-the-fly.
- **Draw 3D Line** – New command to draw a line in 3D.
- **Field Text** – Added method to apply labels to block attributes.
- **Text Math** – New command to apply math functions on values in text labels.
- **Replace Text** – Added method to copy replacement text from another label.
- **Zoom Extents On All Layouts** – New command to do a zoom extents on all layouts in the drawing.
- **Move Text With Leader** – Added option to draw as MLeader. Added settings for separate layer or use layer of text.
- **Offset 3D Polyline** – Added Slope Intersection method to create 3D polyline at intersection of two slopes from 2 reference 3D polylines. Added option to use separate layer.
- **Hatch Wizard** – New command to hatch by picking an interior point.
- **Chamfer By Chord Length** – New command to chamfer by a specified chord length.
- **Rotate By Bearing** – Added option to update existing viewports.
- **Draw Model View** – New command to draw border of model view viewport into plan view.
- **Report Formatter** – Improved saving of the report formats. Added method to setup list of values per field to select from for field options.
- **Command Search** – New command to search menus for a command name.

Survey Commands
- **Legal Description** – Added option for decimal degrees and for fraction degrees. For using centerline option, added setting for max offset for reporting station/offset values.
- **Enter Deed Description** – Added method to enter bearings and distances by selecting text in the drawing. Added method to use TPOB.
- **Section Subdivision** – Added option to draw lines.
- **Cut Sheet** – Added function to undo edits. Added method to apply a pipe equation. Added option to report zero elevations. Added method to import points from text file. Added storing of the report formatter settings into the Cut Sheet .cut file. Added option to color labels by tolerance. Added option to draw arrow from design point towards the survey point.
- **Polyline Report** – Added option to report only the perimeter and area.
- **Bearing Entry** – Added support for entering bearings in formats like "NE45.1234" and "N45 12 34E".
- **Angle Rotation** – Added option to apply rotation defined in Drawing Setup to all bearing and azimuth labels and reports.
- **Edit Process Raw File** – Improved reporting for GPS measurements to include RMS and other values recorded in the raw notes. Added processing for DZ notes. Added method to output selected notes to the coordinate file.

- **Field To Finish** – Added function to edit all the code definitions in a spreadsheet. Added method to hatch areas from closed linework. Added option to thaw layers used during drawing. For text attributes, added controls for label order, separate settings for the size of each label and option to group the text entities. Added new special code LABEL to control point attribute format. Added new special code BFIT to make best-fit line between points. For WALL3D special code, added method to set width by second value after code. Automatically creates photo links when image files are stored by SurvCE. For PHOTO special code, added option to create CAD hyperlinks for images. For Offset Both special code, added option for offset amount as full or half offset. For multi-point symbols, added option to set code for automatic, option for rotate only (no scale) and option to create a fourth corner point. Added method to draw text fitted by two or three control points using multi-point symbol with Fit Description option. Added option to apply rotation to labels only and not the symbols. For Rotate To Line, added settings for align by forward or backward tangents or by ends for culvert. For pipe features, added option to label structures. For tree features, added option to label each field on a separate line and option to group tree trunk circle with the symbol. Added new LTW special code to set line width. Added linework method to stop linework when point numbers change in point groups. Added option to label elevation just once for points on linework or rectangle with same elevation. Added method to use a GIS special code to append to the main code for processing. Added method to use point description for GIS attributes by using Fixed Parameter settings. Added method to put point attributes (name, elevation, description) into custom attributes on the point symbol. For labeling descriptions along linework, added setting for start of the increment. Added a linework coding style for having the linework code before the main code. Added function to import Topcon F2F codes and layers from an XML file. Added LandXML style coding that reads point linework from the XML file to determine how to connect the points.
- **Label Station Offset –** Added option to highlight labels more than specified offset tolerance. Added option to use MLeaders. Added leader style to point to beginning of label. For metric, added cm and mm unit options for offsets. For line from centerline to point, added options to place label along line and to shorten the line.
- **Point Groups** – Added new Isolate function for point groups. Added more functions to call for point groups including Edit Point Attributes, Renumber, Change Elevations and Set Description. Added method to define group by date range using the data stored in the CRD history. Added method to define group by number of digits from start of point numbers.
- **Draw Points** – Added option whether to draw point node.
- **Draw/Locate Points** – Added option to draw only new points.
- **Point Symbols** – Added set of symbols to Symbol Library that have built-in wipeout to hide linework under the symbols.
- **Search For Points** – New command to search for a point number or description in CRD and RW5 files in a folder.
- **Edit Point Attributes** – Added display of images attached to points with ability to add and remove images. Added display of point groups and setting for non-surface status.
- **Renumber Points** – Added method to create points by sequence along a centerline.
- **Edit Points** – Added function to delete a range of points or all points.
- **Erase Points** – Added option to delete the linework associated with the points.
- **Freeze Points** – Added method to freeze linework associated with the points.
- **Local Transformation** – Added method to enter translate, rotate and scale parameters, and save/load parameters to file.
- **Annotation** – Added support for linework reactors to update labels for deflection angle and interior angle labels. Added settings for total distance prefix. Added option for strip trailing zero to leave single zero. Added leader endpoint style of angle, arrow and distance and control for length of leader. Added method to use different number of decimals based on size of the number and added option to round distances to the nearest half. Added option to remove extra leading zero on angles in degrees. Added option on distance units to label as Rods or Varas. Added option to label scale factor when using geodetic distances.
- **Label Coordinates** – Added method to combine coordinate label with lat/lon. Added settings to center justify and to label headers.
- **Label Angle** – Added option for decimal degrees.
- **Line/Curve Tables** – Added method to create a combined line/curve table.
- **Swing Table** – New command to draw a swing table.
- **Stack Label Arc** – Added option for label header line and method to use C/L symbol.
- **Draw Legend** – Added option for second description and method to draw the symbol on the right.

Civil Commands
- **Grid File Format** – Added indexed binary grid format that uses 50% less file size and loads twice as fast.
- **Triangulate and Contour** – Added Reduce Meander filter for creating smoother contours.
- **Triangulation File Utilities** – Added function to break bent edges, to draw ridge/valley lines, to apply polynomial smoothing, and to export x,y,z text file of TIN points. Added controls for the color display method.
- **Triangulation Surface Manager** – Added method to draw Carlson points when adding points to TIN.
- **Slope Zone Analysis** – Added method to model surface using contours and hatch zones between contours.
- **Contour Elevation Label** – Added option for separate layers for main and intermediate labels.
- **Design Pad Template** – Added method to apply subgrade depth to pad when balancing.
- **Edit Pad Template** – Added functions to add and remove perimeter points.

- **Cut/Fill Color Map** – Added option to limit map cut/fill range to color. Added auto color styles.
- **Cut/Fill Movement** – New command to optimize earth movement with reporting by dozer and truck/shovel ranges.
- **Draw Curb Ramp** – New command to adjust 3D curb polylines to fit in ramp of specified dimensions.
- **Lot File Manager** – Added method in check lot to report closure with tolerance and option to draw symbol at any bad misclosures.
- **Tag ROW Segments To Skip Frontage** – New command to control setback amount for lot sides.
- **Input/Edit Centerline** – Added function to scale centerline.
- **Station Equations** – Added support for station-equations in more commands including Input-Edit Profile, Profile Report, Draw Sections, Input-Edit Sections and Section Report.
- **International Roughness Index** – New command to report this index of a profile.
- **Draw Profile** – Added option to use MLeader for leader labels. Added option to draw manhole names within an ellipse. For sewer profiles drawn as single lines, added setting for polyline width. Also for sewer profiles, added option to skip rim and invert elevations for outlet and to skip invert-in label for first structure. For crossings, added option to label elevation at top of pipe and draw label leader to top of pipe. For the horizontal label box, added settings for text offset with a row and option whether to draw row header labels.
- **Draw Section File** – Added sheet output method to model space with viewports from layouts into model space. For crossings, added option to show pipe thickness. For crossings on-the-fly, added method to check selected .sew and .util files associated with the drawing. Added option to output each station to a separate dwg when using vertical stack.
- **Profile Solids** – New command to create profiles from solids or polymesh entities in the drawing.
- **Section Solids** – New command to create cross sections from solids or polymesh entities in the drawing.
- **Input Edit Section Alignment** – Added method to create sections at pipe crossings and method to use polylines to define cross section alignments.
- **Section Cut Sheet** – Added support for using grade ids.
- **Design Template** – Added method for subgrade depth to match existing surface for road rehabilitation. Added option for ditch on end of fill to use only when existing ground goes uphill from the tie.
- **Template Grade Table** – Added method to create table from polylines.
- **Process Road Design** – Added method to output TIN surface for bottom subgrade.
- **Road Network** – For point output, added controls for left and right sides.

Hydrology Commands
- **Rainfall –** Added method to lookup using NOAA Atlas 14 method.
- **Watershed Grid Area** – New command to create grid model of drainage area above each node.
- **Watershed Above Points** – Improved method for calculating watershed using a grid model.
- **Run Off Tracking** – Improved method for using a grid model for calculating flow lines.
- **Time of Concentration** – Added FHWA Kinematic Wave method. For the SCS-TR55 method, added K-table for shallow concentrated method and added method to pick flow 3D polyline and make multiple flow segments using specified delta slope tolerance.
- **Peak Flow Regional Method** – New command for peak flow by this KY DOT method.
- **Edit Bench Pond** – Added option to size for target storage at elevation. Added functions to add and remove perimeter vertices.
- **Design Detention Pond** – Added stage-discharge editing onto the main dialog.
- **Draw Stage/Storage Curve** – Added option for spillway and cleanout.
- **HEC-RAS** – Added support for multiple skews on cross sections.
- **HydroNET** – Improved report contents and format, and added method to report multiple rain events at once.
- **Plan View Labels** – Added option to label pipe stationing.
- **Circular Inlet** – Added support for circular inlets in Sewer Networks.
- **Input Sewer Line** – New command to create sewer network by placing structures on polyline vertices.
- **Sanitary Sewer Network** – Added option to enter known flows and label.
- **Edit Sewer Network** – Added undo function in the editors.
- **Edit Sewer Profile View** – Added functions to change pipe size and rim elevation.
- **Move Plan View Label** – Added option to use leaders.
- **Sewer Network Quantities Report** – New command to report pipe and structure quantities by depth.
- **Import Network From Text File** – New command to read a sewer network model from a CSV text file.
- **Transform Coordinates** – New command to transform the x,y coordinates in a sewer network model.
- **Report Sewer Network** – Added method to report multiple storm events at once.
- **Utility Network** – Added setting for utility type (ie. gas or water) with default colors per type. Added support for rectangle, hexagon, trapezoid and ellipse shape pipes. Added method to place solids along utility alignment for valves, connections and elbows. Added support for laterals with spreadsheet editor and methods to input by picking points or lines. Added material

quantities report. Added pipe material parameter and user-defined parameters to the model. Added LandXML export for utility networks.

GIS Commands

- **Point GIS** – New system to store GIS data in CRDB coordinate files with ability to use this data in all point based GIS commands.
- **Point GIS Editor** – New command to import, export, edit and report GIS data for points.
- **Topology Area Check** – New command to find gaps or overlaps.
- **Topology Point Check** – New command to report points that are within tolerance of each other.
- **Set Text Layer By Text String** – New command to set text entity layers to match the text string.
- **Web Feature Service (WFS)** – Added default service for FEMA and USDA soil maps.

Geology Commands

- **3D Kriging** – Upgraded 3D kriging routines and 3D variogram. Added option to output statistics grid with estimated error per node.
- **Voronoi Modeling** – Added method to create models using the Voronoi algorithm.
- **Define Grade Parameters** – Added option to set density per grade to use in reporting tons in Surface Mine Reserves.
- **Make Block Model** – Added option to set top/bottom surface grids for top/bottom of cells with grade defined to crop out no grade cells.
- **Edit Drillhole** – For angled drillholes, the editor shows the adjusted elevations.
- **Draw Geologic Column** – For angled drillholes, the labels use the adjusted elevations.
- **Isopach Maps Auto Run** – Added support for hatch zones.
- **Inspect eLog** – New command to report values in real-time while moving cursor along eLog graph.
- **Remove All Non-Key Bed Names** – New command to remove bed names from non-key strata.
- **Key Strata Missing Bed** – New command to report strata with blank bed names.

Surface/Underground Mining Commands

- **Range Diagram** – Added summary report of rehandle and spoil rehandle parameters. Add function to transfer current dragline and function to clear.
- **Spoil By Interior Text** – New command to assign names to spoil polyline using interior text.
- **Design Bench Pit** – Added method for slopes with fixed width.
- **Surface Equipment Timing** – For 3D pick, added method to color timing blocks by grade parameter.
- **Surface History** – Added method for picking pit and perimeter polylines for manually defining surface history.
- **Flatten Spoil Top** – Added method to flatten to a specified height about the pit floor.
- **Sections From 3D Solids** – Added method to use MXS section alignment file.
- **Make Solid From Design** – Added method for template transitions.
- **Trim Solid** – New command to trim a solid model by a perimeter polyline.

Construction/Trench Commands

- **Tag Area of Interest** – Added support for using multiple areas with the same name.
- **Make Design Surface** – Uses layer settings to set colors for the TIN.
- **Calculate Total Volumes** – Added option to output report to layout.
- **Make Overexcavate Surface** – Added function to define by selecting a TIN file.
- **Make Layout** – New command to create a layout with title block and optional model view.
- **Save/Restore Layout Layers** – New commands to store and recall the visible layers for the layout model view.
- **Place Image on Layout** – New command to crop an image to fit the dimensions of a view window.
- **Linework Length Report** – New command to report lengths of linework.
- **Cost Summary Report** – New command to report project costs from Takeoff commands including Material Quantities and Calculate Total Volumes.
- **Input Trench Line** – Added method to make trench at fixed depth from the surface.
- **Import Sewer Network** – New command to import a sewer network .sew file into trench network.
- **Import Utility Network** – New command to import a utility network .util file into trench network.
- **Input/Edit Trench Template** – Added method to define backfill relative to middle of pipe.
- **Trench Network Quantities** – Added option for costs in the report.

CADnet Commands

- **Import PDF File** – Added method to handle dense hatch by option to skip tiny lines.
- **3D PDF Reports** – Added method to use template PDF. Added output to 3D PDF directly from 3D Viewer Window and 3D Drive Simulation commands.
- **Trace Polyline** – Improved ability to follow image and snapping. Added method to create 90 degree corners. Added auto zoom options. Added ability to switch active end of line for tracing.
- **Trace Rectangle** – New command to draw a rectangle from an image.
- **Trace Circle** – New command to draw a circle from an image.
- **Replace Color** – New command to reassign selected colors to a new single color.
- **Remove Speckles** – Added method to select area to process by window or polyline. Added option for preview.

Point Cloud Commands

- **Import IMG** – Added function to import image DEM files.
- **Regions** – Added functions to define and set visibility for a selection of points in the cloud.
- **Contours** – Added Reduce Meander filter for creating smoother contours.
- **Import Cloud** – Added option to batch import files (ie LAS and E57) and to apply scale on import.
- **Color Cloud** – Added method method to color by elevation range with control of range with repeating pattern.
- **Subtract Cloud** – New function to subtract cloud from current cloud.
- **Scale Cloud** – New function to scale cloud between feet and meters or by custom amount.
- **Camera** – Added clipping method by polyline.
- **Command History** – Added function to report the history and added option to time stamp each command in the history.

Data Conversions

- **Civil 3D** – Added support for spot elevations in Import Civil 3D Labels.
- **Geoids** – Added support for Florida FPRNGD16, Malaysia EMGG05a, Australian Cocos, Norway 2016Aand Latvia 15.
- **Indiana** – Added Indiana County projections INDOT INGCS.
- **MicroStation** – Upgraded routines to import and export GENIO files.
- **Trimble** – Added import/export of Trimble GIS attribute data from CSV files.
- **WinCMM** – Added support for .cor and .lev files in Points > Read Text File.