

# Improvements for Takeoff R11

## General

- **Migration Wizard** – New command to transfer program settings and files between program versions.
- **Carlson Academy** – New command for on-line learning with movies, blogs and data sets.
- **Ultra High Resolution Displays** – Improved font and image scaling for dialogs.
- **LandXML** – Added method to export 3D polylines as alignments.
- **Open Drawing** – New command to select geo-located drawings from a map view.
- **File Selection** - Expanded list of files in current folder and added ability to sort by the file name, size or date.
- **Drawing Explorer** – Added Carlson surface objects, more right-click commands and setup double-click commands.
- **MText Labels** – Routines with option to hide drawing under the text use the mtext background mask instead of separate wipeout entity. Applies to commands such as Triangulate & Contour for contour labels and Leader With Text.
- **Zoom Most** – New command to zoom to show the bulk of the entities in the drawing and avoid outliers.
- **3D Viewers** – Major performance improvements for handling large models. Added method to use different textures for surfaces based on slope. Added method to color the surface by the normals of the 3D faces. Added display of x,y,z coordinates for position of the cursor on the surface. Added control for thickness of linework. Added keyboard controls for panning and zooming the scene. Added clip planes from top and bottom, plus way to enter elevations or screen pick clip plane position. Added x-ray view mode to make surface transparent in window around the cursor. Added method to select more entities from the drawing to add to the current scene. Pick mode displays distance from previous pick point. Added option to label the bounding box with x,y,z. Added methods to texture surface by slope range and to substitute a texture per color. Added setting for pixel size to draw point entities. Added keyboard hot-keys to rotate left/right and up/down. Added settings for default surface colors.
- **Centroid Point** – Added support for calculating the centroid for a solid model.
- **Draw 3D Polyline** – Elevation prompt has new method to add or subtract an amount like for a curb.
- **Hatch Wizard** – Added auto-connect mode to make closed areas from selected linework.
- **Boundary Polyline** – Added method to create closed polylines for all the areas from the input linework.
- **Edit Table Properties** – Added method to automatically create multi-line rows for long labels.
- **Text on Line/Polyline** – Added method to select label polyline by picking a crossing line and added options to hide the drawing under the labels, to center the text on the line and to repeat the placement.
- **White Solid Behind Text** – Added setting for layer name.
- **Output Layouts to PDF** – Added option to optimize geometry.
- **Drawing Setup** – Added optional field for project location to include in reports and use for geolocating.
- **Report Formatter** – Improved Import/Export to process selected reports and avoid name conflicts.

## Takeoff Commands

- **Takeoff Surfaces** – Added options to densify breaklines.
- **Assign Contour Elevations by Label** – Allow processing multiple layers for the contour lines.
- **Edit Assign Polyline Elevations** – Added a dynamic profile view in the dialog. Added by crossings option to add vertex on reference crossing polylines. Added option to label non-control points and setting for label alignment.
- **Trench Quantities By Profiles** – New command to calculate trench quantities using trench and surface profiles.
- **Define Layer Surface/Material/Subgrade** – Added method to create solids of subgrades.
- **Display Surface** – Added option to draw triangulation as a surface object.
- **Edit Assign Polyline Elevations** – Added function to set elevation from a surface model, and added reduce function option to retain all control points. Polyline edits automatically update TIN surfaces that include the polyline.
- **Make Combined Removal Surface** – New command to make a TIN surface from all the removal surfaces.
- **GeoTech Edit Drillhole** – Uses strata attributes from Define Attributes and drillhole attributes from Define Lookup Database.
- **Raster Decompress** – Added support for TIFF image in LZW compression.
- **Export Solid Model IFC File** – New command to create an IFC model from a Carlson solid model.
- **Rubber Sheet** – Added mesh transformation method. Added initial transform when destination control points are outside original image. Added report of control points. Added import/export functions for control points.

## Point Commands

- **Draw Points** – Added option to limit the length of the drawn description and notes.
- **Edit Points** – Added a toolbar to the dialog for quicker access to common functions.
- **Point Group Manager** – Added functions to sort the groups by name or number of points.
- **Cut Sheet** – Added option to set colors for cut and fill labels.

- **Label Coordinates** – Added method to select points by point name or point group. Added method to label point numbers.

## Road Commands

- **Centerline** – For ROW definitions, added support for using arcs.
- **Centerline Report** – Added method to set a second centerline and profile for making offset reports.
- **Quick Profile** – When alignment is adjusted, added option to save a centerline file.
- **Draw Profile** – For road intersections, added option for separate prefix/suffix for each label. For sewer labels, added separate precision for invert and rim. For horizontal axis labels with cut/fill active, added option to center on the middle label. For culvert headwalls, added setting for width. For horizontal label box, added method to create gaps between rows.
- **Section Files** – Changed default file extension to .xsct to avoid getting blocked by email servers. The .sct is still available.
- **Input Edit Section File** – Added method to update From Elevation when edit slope. Added function to Rename Stations to remove station equation adjustments.
- **Sections To 3D Polyline** – Added option to layer the polylines using the section offset descriptions. Added option to connect 3D polylines by sequence number of the section offsets.
- **Draw Section** – Added option to hatch subgrades. Added option to label offset distances between data points. Added option for label along vertical axis.
- **Template Grade Table** – Added Import Polyline function to use a 3D polyline to set slopes.
- **Design Template** – Added method for subgrades to set their distance to the TIE point. Added method for subgrade slope method of Continue Slope to tie in vertically at grade limit when no intersection is available. Added method to import a 3D polyline to define the grades.
- **Template Series File** – Added support for interpolated curb dimensions between templates.
- **Process Road Design** – Added method to skip the first template grade for adding onto existing roads. For cut/fill bench surfaces, added option for user-entered elevations. For super elevation, added a method to set the low side pivot point. Added option to output solid models for the subgrades.
- **Road Network** – Added method to draw 2D template polylines. Added method to output multiple EOP profiles.

## Surface Commands

- **Triangulate and Contour** – Added option for inclusion/exclusion perimeters to break the edges at the boundaries.
- **Draw Triangular Mesh** – Added option to color breakline edges separately.
- **Triangulation File Utilities** – Added Quadric Error method for the Simplify function. Added a Laplacian method for the Smooth function. Added minimize flat triangles method in the Enhance Flats function. Added function to Refine triangulation that adds points for more uniform triangles. Added Export method to output a text file of the points and triangle indexes. Added Shrink-Wrap function that removes perimeter edges. Added Clean function to remove duplicate points within a tolerance and rebuild. Added Improve Valley function for flowline in valleys. Added functions to Crop or Cut the TIN by a perimeter polyline. Added Clean function to remove skinny and tiny triangles. Added smooth method that uses moving least-squares.
- **Triangulate Surface Manager** – Improved performance for editing large TINs by using custom object to display edges and contours. Added separate color for breakline edges during TIN editing. Added function to add points to the TIN by point number range or point group, and to include Field to Finish generated breaklines from these points. Added functions to untag edges as breaklines, to remove triangles by window selection and to remove by perimeter polyline. For TIN history, added method to change original selection set to create the TIN.
- **Grid File Utilities** – Added smooth function that uses a moving least-squares method.
- **Cut/Fill Color Map** – Added support for True Colors.
- **Cut/Fill Labels** – Added option for custom colors.
- **Surface 3D Flyover** – Added method to add a solid model to the scene.