



# Trimble Business Center

## Release Notes

TBC Version 2024.10

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## Welcome to Trimble Business Center

Trimble Business Center (TBC) provides a complete office software solution for survey and construction professionals. Having the ability to work in a single software environment streamlines operational efficiency while minimizing the costs of data management, software maintenance, and training.

**Important Note!** This version of Trimble Business Center is available to:

- Perpetual license users whose current warranty expiration date is **November 1, 2024** or later. (If your perpetual license warranty expires prior to this date and you proceed with the installation, licensed features will not be available.)
- Subscription license users whose subscription is currently active.

If necessary, you can contact your distributor to purchase a warranty extension or renew your subscription. In the TBC ribbon, select Support > License Manager to view your warranty or subscription expiration date.

## New features

Following are the new features and enhancements included in this version of Trimble Business Center. To view context-sensitive help in TBC while using any of the commands mentioned here, simply press **F1**.

### User Profile

- **Extended offline period for TID accounts** - Up till now, TBC users enjoyed a 7-day offline period before needing to reconnect online to re-sign into their Trimble ID (TID) accounts. Based on valuable customer feedback, the offline period has been extended to 30 days. This change will provide greater flexibility and convenience, allowing you to work longer offline without interruptions.

### Coordinate System

- **Updated Coordinate System Database** - The newest Coordinate System Database v110 installed with TBC v2024.10 includes the following enhancements:
  - Upgraded datums for Ecuador, Colombia and Chile with new VEMOS 2022
  - Added support for new realization of WGS84 (G2296)
  - Added support for Dubai Local TM Zone
  - Added Geoid Model for South Tyrol
  - Updated DB zones and import of VA zones in Germany
  - Fixed RTX in Croatia using ETRS89 as global reference datum

- Updated displacement model for Japan JGD2011 to 2024 version
- Updated GSI Geoid 2011 for Japan to latest version 2.2
- Fixed RTX in Portugal and cleaned up predefined systems
- Added new extraction of EGM2008 for Zambia
- Added Turkish Geoid Model-2020 and used it as default with Turkish zones
- **Support for both global and ITRS vectors** - Using Project Settings > Computations > GNSS Vector, you can now select the Coordinate Reference System (CSR) in which vector coordinates are displayed and exported:
  - Global datum at reference epoch
  - ITRS at measurement epoch

Exporting vectors in the International Terrestrial Reference System (ITRS) at measurement epoch may be required to perform a network adjustment in third-party software expecting vector coordinates in this Coordinate Reference System.
- **Select coordinate type when importing OPUS solutions** - When importing position solution data from the NGS OPUS website, you now have two coordinate type options:
  - Local - Import the local NAD83 coordinates computed by NGS (default).
  - Global - Import ITRS coordinates at the measurement epoch, then recompute global and local coordinates using the specified coordinate system, just as can be done when importing Trimble RTX Solutions.
- **Improved support for SnakeGrid** - TBC now supports all available types of SnakeGrid files, which can be purchased online and imported into large projects to minimize distortion.

## Network Adjustment

- **Customized network adjustment weighting** - The Network Adjustment command has been enhanced to support user-defined *variance groups*. GNSS vectors can be assigned to defined variance groups, each of which is available for custom weighting in the least-squares network adjustment. This is in addition to the standard predefined variance groups already included in TBC, providing you with many easy-to-create weighting options customized to suit your needs.

## GIS

- **Import taped measurements from Trimble Access** - Import into your TBC project lines computed from taped measurement observations entered in Trimble Access (for example, a line resulting from a measurement from one corner of a building along its face to the next corner made with a steel tape). Each tape-measured line is automatically labeled in TBC graphic views with the horizontal distance between its two points (the line's length). The line's attributes include azimuth, horizontal distance, survey name, and equipment used.

- **Enhanced Write Features to GIS report** - The Write Features to GIS report, which you can select to generate after running the Write Features to GIS command, now includes more detailed information, helping you to more easily monitor the transaction and troubleshoot any issues that might arise. In addition, you can now click in the report to select any affected geometry so that you can quickly make corrections as necessary (for example, enter a Z value or explode a block).
- **GIS export report** - After using the Export command to export GIS data from your project to Esri, Geodatabase, or Shapefile, you can now select to generate an Export report that provides descriptive warnings and errors resulting from the export in an easy-to-read format, helping you to monitor the transaction and troubleshoot any issues that might arise.

## CAD

- **Include annotated lines and surfaces in IFC exports** - The IFC (Industry Foundation Classes) exporter now enables you to include annotated (non-IFC) simple linework (straight lines and arcs, including linework in CAD blocks) and surface objects in the exported IFC file, along with the selected IFC objects. When the exported IFC file is imported into a TBC project, annotated linework and surface objects are imported along with the IFC objects and are displayed in the graphic views. In the Project Explorer, annotated object nodes are grouped together beneath an "Appended data" node for the BIM Data Project, ensuring easy review and selection.
- **Enhanced polygon boundary selection** - The Select by Polygon command, which can be used to select objects that lie planimetrically inside, outside, or crossing a specified polygon or closed line boundary, has been enhanced with two new selection options:
  - *Part of boundary* - Every line that is part of the composite geometry that makes up the boundary, or is coincident to it, is selected.
  - *Inside or part of boundary* - Every line that is part of the composite geometry that makes up the boundary, or is coincident to it, is selected, along with the elements contained within the boundary.

This enables you to create composite geometry from any given number of touching linestrings (regardless of the shape) and use it as a selection boundary that includes all the linestrings that make up the boundary and, optionally, all of the objects inside the boundary.

- **Create points from BIM objects** - Use the new Create from BIM command to create points from BIM/IFC objects using either or both of the following methods:
  - Create points from *mesh centroids* using either individual mesh centroids, the BIM object's geometry centroid, or the BIM object's center-of-gravity property.
  - Create points from *mesh faces* using either all selected mesh faces, all horizontal mesh faces only, the lowest horizontal mesh faces, or pipe/beam end faces.

- **Insert Line Segment standard command** - The Insert Line Segment macro command has been added to TBC as a standard command so you can insert a new segment into a linestring, either along a selected segment or beyond the start or end point.

## Corridors and Alignments

- **Extract linework from a corridor surface** - Use the Save linework property of a corridor surface to extract linework (as linestrings) from the surface and generate a linework object in the Project Explorer so you can send it to the field as a design map. If you delete the linework object, the property is set back to No. A corridor surface linework object can be shared in a VCL file (includes the corridor surface).

In Project Settings > Computations > Corridor, you can also set Save Linework to Yes to automatically save corridor breaklines as linestrings (and a separate node under the corridor surface in the Project Explorer) when you create a corridor surface.

- **Analyze IRI values for multiple corridor segments simultaneously** - When running an International Roughness Index (IRI) Report command to get enhanced IRI deliverables, you can now select multiple trajectories/alignments/linestrings from which to create offset left and right wheel paths and run IRI analyses so that the deliverables can all be generated at once.

**Note:** Stationing Options and Custom Station Ranges options are disabled if you select more than one path.

Also, when you choose to create an Excel report, you can now save segment scores in:

- **New sheet** - Write results for each selected path segment on two separate tabs (sheets; one Summary and one Detailed Results) in a single Excel file (workbook).
- **New workbook** - Place Summary and Detailed Results for each selected path segment in a separate Excel file (workbook).

**Similarly, when you export to AgileAssets, you can save segment scores in:**

- **Single document** - Place all results for each selected path segment in a single .csv file.
- **Multiple documents** - Place results for each selected path segment in a separate .csv file.

## Surfaces

- **Resolved issue** - Overlapping vertices from very small triangles were influencing slope-based surface elevation adjustments. They created small (~3 cm) spikes in the surface, resulting in scattered normals and uneven/spiky shading. This issue was fixed by the addition of a clustering algorithm that groups neighboring vertices into small (~1 mm radius) clusters.

## Photogrammetry

- **Create orthomosaics from facades** - Use the new Create Orthomosaic from Facade command along with a custom-designed cutting plane to create an orthomosaic TIFF photo of a vertical facade, such as the face of a building composed of many images captured with a UAS drone. The TIFF file, along with the companion text file containing 3D coordinates for the orthomosaic, can be imported into the current, or any, TBC project as a georeferenced image.
- **UAS camera merge option** - When using the Merge Flight Missions command, you now have the option to use only one camera (requiring only one camera calibration) for all merged flight blocks captured with the same camera (default) or to use a separate camera (requiring one camera calibration each) for each individual flight block. When you opt to use only one camera for all flight blocks that are not RTK or PPK processed, only three GCPs are required. Otherwise, three GCPs are required for each flight block.

## Point Clouds

- **Generic feature point extraction** - The Extract Point Feature command enables you to manually or automatically select one or more feature objects in a point cloud region that has been classified to include those features and automatically create a new feature point for each with an assigned feature code and attributes (as applicable). In the past, the command supported the extraction of tree, pole, sign, and manhole features exclusively. For this release, it has been enhanced to support the extraction of *any feature* with an identifiable shape (for example, utility boxes or fire hydrants), allowing you to customize the command as necessary to meet your specific extraction needs. (Note: Classification results will determine the level of accuracy to be expected.)
- **Faster, more controlled point cloud filtering** - The Filter Point Clouds command allows you to easily extract a new point cloud region that includes only the scan points located within a specified distance from a scan station, or from an alignment or CAD line. For this release, the command has been enhanced to provide:
  - A simple means of specifying a vertical offset used to control the height of the resulting point cloud region when filtering along an alignment or CAD line.
  - The selection of closed CAD lines and multi-segment lines with different segment types (including arcs).
  - Much shorter processing time, especially when filtering along long lines (200+ m), as are often found in Mobile Mapping projects.
- **LAS export per station** - The LAS point cloud exporter now enables you to select with a single click to automatically export a separate LAS point cloud file from each scan station in a multi-station setup, instead of a single LAS file from all of them. So when you require multiple station-specific LAS export files, this option provides a quick and easy alternative to exporting them one station at a time (typically done by hiding and showing scans using the View Filter Manager).

- **Publish point cloud data and panoramic images to Trimble Connect** - Use the new Publish Scan Data command to upload point cloud data and/or panoramic images from your TBC project to a Trimble Connect project where it can be shared with other authorized users. In Connect, users can view the point cloud and images, take measurements, add arrows and text annotations, draw, and more.

## Mines

This version of TBC introduces the newly available TBC Mining subscription, which provides analytics during construction and operations from geospatial data captured in open-pit and surface mines using GNSS, total stations, drones, laser scanners, and/or mobile mapping systems. This information is critical to ensure the current as-built mine surface conforms to the design and slope stability safety standards.

- **Automatically extract breaklines from open-pit mines** - The new Extract Mining Breaklines command enables you to automatically create breaklines from open-pit mine slopes captured in a point cloud, including toes and crests for benches (haul roads) and berms, the bottom of the pit (toe), and the top of the pit (crest). You can review and edit the resulting linework, and you can use the Create Surface command to create a surface model from the extracted breaklines that can be used to create a *Mining Slope Conformance* report.
- **Report on Mining Slope Conformance** - Create a heat map and cross section report based on an open pit mine surface model that visually indicates overall slope conformance compared to design parameters such as bench height, width, and face angle, and identifies potential areas of safety concern on the mining slope. This report can be customized as necessary to meet client needs simply using a Microsoft Word template.

## Mobile Mapping

- **Extract pavement lane lines automatically** - The Extract Line Feature command includes a new option that enables you to automatically extract pavement lane lines from images captured with a Trimble Mobile Mapping Ladybug 360-degree camera and laser scanner. Working with a preclassified *Ground* point cloud region, a deep learning model is used to automatically detect lines on each image frame and map them to the point cloud to create 3D linestrings. (*Note:* This new option is in addition to the semi-automatic lane line extraction process that can already be performed on point clouds without the need for a 360-degree camera.)
- **Create a mosaic of orthorectified imagery from back-facing Mobile Mapping images** - Use the new Ortho Lane command to create orthorectified images combined in a single orthomosaic based on images captured by a Trimble Mobile Mapping system with a back-facing camera. As part of the overall pavement inspection workflow, the resulting auto-generated orthorectified images can be used for the automatic computation of crack dimensions (including crack width) using the Inspect Pavement Condition command.

- **Automatically detect/measure pavement cracks using orthorectified imagery** - The crack detection feature in the Inspect Pavement Condition command now provides the option to automatically compute pavement crack dimensions, including crack width, for severity using orthorectified images created by the Ortho Lane command. Due to the orthorectification of the images, the computed crack dimensions are more accurate than those resulting from the use of normal back-facing images, particularly concerning crack width.
- **Inspect road shoulders** - The Inspect Pavement Condition command has been enhanced to support the measurement of the drop-off (difference in elevation) between the edge of a road's pavement and the shoulder to identify low, medium, and high severity levels for individual drop-off conditions.
- **Unstitch panoramic images into individual rectified images** - In TBC, 360-degree panoramic images can be unstitched into six separate rectified images. These images are flat and typically represent the different directions of the 360° camera. The rectified images can be visualized in a specific view.
- **LiDAR QC support** - LiDAR QC is an advanced trajectory processing technology that, similar to LiDAR SLAM, is using scan data as an aiding sensor to improve georeferencing accuracies in areas of poor GNSS coverage or in areas where overlapping scans are not perfectly matching.

Based on a robust and iterative least square adjustment, LiDAR QC generates 3D Voxels that are matched in overlap scan regions. The result of this iterative process is solving the constant IMU boresight angles and making corrections to the post-processed trajectory (position and orientation).

*Note:* To use the LiDAR QC feature in TBC, it is necessary to install the MATLAB Runtime after installing TBC. The MATLAB Runtime enables the execution of compiled and packaged MATLAB applications within TBC without the need to install MATLAB itself. You can download the MATLAB Runtime from the MathWorks website at <https://fr.mathworks.com/products/compiler/matlab-runtime.html>.

- **GV target registration** - The GV target is a new L-shape target pattern designed specifically for use in the Point Cloud Smart Picking tool, particularly for the registration of a run (or mission). This target is tailored for applications within the Germany Rail context, providing enhanced accuracy and efficiency in point cloud data registration.
- **Process raw trajectory data** - Following are two major enhancements implemented for processing raw trajectory data:
  - **Timing** - The start and end times for the GNSS-Inertial processor are now set using GPS seconds of the start week. This provides a standardized time reference, ensuring consistency and accuracy in timing data.
  - **DMI scale factor** - The DMI (Distance Measurement Instrument) scale factor has units of Pulses per Meter (PPM). It is the inverse of the scale factor that multiplies the DMI pulse count to yield the distance traveled.



## Third-party tools

- New commands in the ANZ Toolbox include:
  - **Surface Cleanup** – The Surface Cleanup command allows you to optimize surface geometry by averaging nearby vertex positions or holding original ones and removing ones that fall within tolerance. This can remove small, unrequired triangles from the surface and build a new one which improves performance and results.
  - **Segment Count** – The Segment Count command allows you to count the total number of horizontal segments in the selected lines. This is useful for checking the segment numbers of avoidance zone polygons which have a maximum number allowed in Earthworks machines.
  - **3D Object from Shape** – The Extrude from Shape command enables you to select a closed polygon and extrude it along a control line. Options exist to create cross-section strings, longitudinal strings, and 3D shells that can be used for setting out or as-built models.
  - **3D Object from Lines** – The Extrude from Lines command enables you to select a group of lines to be used to form a shape and extrude it along a control line. Options exist to create cross-section strings and 3D shells that can be used for setting out or as-built models.
  - **Match 12d Attributes** – The Match 12d Attributes command allows you to select a source object containing 12d attributes and match (copy) them to target objects.
  - **Adjust Level by Attribute** – The Adjust Level by Attribute command allows you to use the attribute values of points and linestrings to adjust their level. This will also work on points prior to processing their feature codes.
  - **Array** – The Array command allows you to make copies of objects using various array methods. This is a simple way to propagate objects in different geometric patterns, from simple grids to laying out guard rail posts along a road.
  - **ASPEC Manager** - The ASPEC Manager command provides an improved workflow to automatically fill in geometric attributes, modify data, check for unfilled attribute values, and export completed shape files.
  - **ASPEC Auto-Fill** - The ASPEC Auto-Fill command allows you to automatically fill in geometric attributes for many ASPEC features and enter project-wide attribute values.
  - **Process ASPEC Connections** - The Process ASPEC Connection command allows you to process specific pipe, conduit, and Headwall data for D-SPEC and pump stations for W and S\_SPEC.

## Important notes and known issues

See the TBC Help for a complete, up-to-date list of important notes and known issues related to TBC.

## System requirements

|                                    |  |
|------------------------------------|--|
| <b>Microsoft operating system:</b> | Windows® 10 (64-bit version)<br>Windows 11 (64-bit version)  |
| <b>Processor:</b>                  | Dual-core 1.80 GHz or better recommended<br><br>Quad-core 2.80 GHz or better (additional cores with hyper-threading support highly recommended for Aerial Photogrammetry, Mobile Mapping, and Scanning modules)<br><br><b>Important!</b> Because components of TBC make use of Intel-only multi-thread processing, AMD Ryzen processors are not supported. |
| <b>Random access memory (RAM):</b> | 4 GB or more recommended<br><br>32 GB or more recommended for Aerial Photogrammetry, Mobile Mapping, and Scanning modules  |
| <b>Hard disk space available:</b>  | 30 GB or more recommended<br><br>100 GB or more on solid-state drive required for Aerial Photogrammetry, Mobile Mapping, and Scanning modules<br><br>The recommended SSD overall hard drive capacity is 500GB or more for Aerial Photogrammetry, Mobile Mapping, and Scanning modules  |
| <b>Monitor:</b>                    | 1280 x 1024 or higher resolution with 256 or more colors (at 96 DPI)   |
| <b>I/O Ports:</b>                  | USB 2.0 port required if HASP hardware key is used   |

**Graphics:**

DirectX 11 compatible graphics card with 512 MB memory or more

OpenGL version 3.2 or later required when working with point cloud data (latest version recommended)

8 GB or higher graphics card (for example, NVIDIA Quadro P4000) recommended when working with Aerial Photogrammetry, Mobile Mapping, and Scanning modules

**Note:** 6 GB or higher NVIDIA graphics card with CUDA compute capability (5.0 or higher) required when working with point cloud classification.

**Note:** If you are using a laptop computer with both an integrated (on-board) graphics card and a discrete NVIDIA graphics card enabled via Optimus technology, your computer must allow you to select to disable the integrated graphics card and use only the discrete graphics card when working with point cloud data. See "Disabling a laptop integrated graphics card" in the "Important Notes" topic in the TBC Help.

***Important!***

**It is critical that you keep your graphics driver(s) updated if you are working with point cloud data.**

Whether your computer has one or multiple graphics cards installed, you must ensure each has been updated with the latest driver provided by the card's manufacturer. The best way to determine if your driver needs to be updated and, if so, perform the update is to visit the card manufacturer's website. For more information, see "Update and Configure Your Graphics/Video Driver" in the online Help.

(If, instead, you decide to update your driver using the Windows Device Manager and the "Search automatically" option, the program may suggest using a Microsoft-approved WHQL version of the driver. However, to ensure you have the latest bug fixes and new features for your graphics card, it is recommended that you use the latest manufacturer version instead.)