



Trimble Business Center

Release Notes

TBC Version 2024.00

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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 **May 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**.

Corridors and Alignments

- **New International Roughness Index (IRI) Report** - As a Mobile Mapping or Terrestrial Scanning user, run the International Roughness Index (IRI) Report command to get enhanced IRI deliverables that can simplify your workflow. Based on point cloud data, this road surface roughness report can be generated without the extra steps of creating corridors or manually draping wheel path lines on a surface. The report includes left and right lane scores (along with other results) that can be exported to Trimble AgileAssets and as a Microsoft Excel sheet. Different from the previously released Roughness Report, this report is designed for:
 - **Simplified analysis process** - The report can now compute IRI as soon as scans are generated in a TBC project. These changes simplify and speed up the IRI analysis process. Scans should be based on either:
 - an aggregate metric evaluated by measuring the longitudinal profile of road pavement, generally along a wheel path or
 - the average of wheel paths in both directions.

- **More usable results** - Problem areas that need to be examined are now highlighted so you can address IRI values that do not pass your specified threshold. This connection between reported values and the data used to generate them means you no longer have to look at station values in the report and then find that starting station in your alignment to identify problem areas. The report creates linestrings that are colored similar to RMS values of the mobile mapping trajectory. The default Microsoft® Excel output can be easily imported into other software, such as AgileAssets Pavement Express. You can also select created CAD linework and export it in a desired format using standard exporters in TBC.

Coordinate System

- **Coordinate System Database (CSD) enhancements** - Since the release of TBC v2023.10, the default Coordinate System Database (current.csd) installed with the application has been enhanced as follows:

CSD Database v108:

- Modernized support for Philippines
- Updated US State Plane Zone Extents
- Updated Japanese State Plane Zone Extents
- Modernized support for Tanzania with datum TAREF11 and geoid EGM2008
- Added new geoids ROvT4.08 for Romania and Bucharest
- Added support for Guatemala
- Added support for Wisconsin Transverse Mercator
- Added new geoid model RAC23 for Corsica
- Added new geoid DVR90 2023 for Denmark
- Added new ITRF2020 plate motion model
- Corrected wrong missing values in AusGeoid2020 Geoid

Note the following:

- The geoid AUSGeoid2020(Australia) using the legacy file ausgeoid2020.ggf is now "hidden" for backward compatibility with old projects and jobs.
- Although it is hidden for use with new projects, this geoid remains in the library and will be used as necessary when opening an old project or file to which it is assigned.
- Geoid AUSGeoid2020(Australia)-fix was added using the file ausgeoid2020-fix.ggf, referenced as the default geoid model in all Australian Zones using this model.

- The new geoid AUSGeoid2020(Australia)-fix provides the exact same results as the old geoid AUSGeoid2020(Australia) in all areas where the user does not get any error message. It also fixes inappropriate error messages that some users might have encountered in specific areas.

CSD Database v109:

- Updated six ellipsoids, removing insignificant digits in the semi-minor axis. (This may generate warnings during the database upgrade process; however, there will be no impact on final coordinates.)
- Updated predefined zones for Slovakia
- Fixed RTX with Lambert county zones in Minnesota and old county zones in Wisconsin
- Refined zones for Deutsche Bahn
- Added support for all realizations used in California
- Improved extents for SVY21 Zone and ZoneGroup
- Added latest geoid model FIN2023N00 for Finland
- **Import coordinate system parameters in Coordinate System Manager** - The Coordinate System Manager (CSM) now provides the option to add user-defined coordinate systems to your coordinate system database (CSD) using imported JXL (.jxl) or WKT (.txt) files that contain the coordinate system parameters you want to apply. This enables you to more quickly add multiple user-defined coordinate systems and eliminates manual entry errors. All imported parameters can be reviewed in CSM before saving.

Network Adjustment

- **Include subnetworks in a network adjustment** - The Adjust Network command now allows you to perform a least-squares network adjustment that includes two or more subnetworks (networks with unconnected observations) within your project. You can specify adjustment parameters for each subnetwork individually as necessary before all subnetworks are adjusted together. An individual adjustment report is generated for each subnetwork.

GIS

- **Exchange composite geometry and curves with a GIS data source** - When exchanging data with a GIS data source using the Read Features from GIS command or the Write Features to GIS command, you can now include composite geometry and curved lines. Composite geometry combines simpler geometric objects, such as lines and/or polygons, into a single multipart geometric object used to represent complex spatial features, including objects with "holes" through them, such as bridges and archways. (See also "Create composite geometry" later in these *Release Notes*.)

- **New selection options when reading features from a GIS data source** - When using the Read Features from GIS command, you can now select to filter the features downloaded into your project using the following options:
 - Include only those features whose attributes match one or more specified values (for example, download only features whose "material" attribute is equal to "concrete"). This gives you even more control in determining which data you want to download and work with.
 - Include only those features contained within an existing polygon or a temporary polygon you create just for filtering purposes. This provides more flexibility and speed when selecting a subset of features to download and work with in TBC.
- **Exchange alignments with a GIS data source** - When using the Read Features from GIS command, in addition to selecting a polyline, you can now optionally select an alignment as a feature type for linework. The alignment can then be edited in TBC if necessary and uploaded back to the GIS data source with the *Alignment* feature type assigned using the Write Features to GIS command. Optionally, you can select any existing alignment in your project, assign a feature code to it and process feature codes, and then upload the new alignment feature to the GIS data source.
- **Exchange data with SQL Server Service** - The GIS Connection Manager in TBC now allows you to select a SQL Server Service data source type, in addition to all of the other source types available from which to choose. SQL Server Service provides queuing and reliable messaging for SQL Server, allowing you to easily access spatial database tables stored on the server. Simply select the authentication method (Windows or SQL Server), select the SQL database, and select the tables containing geometry data fields to which you want to connect.
- **Saved Esri service connections** - When you establish a connection to an Esri service provider using the GIS Connection Manager command, your selection (URL and, if applicable client ID and return URL) is stored in TBC so that the next time you need to connect to the same provider, you can simply select it from a drop-down list in the Select GIS Data Source dialog. This saves you time and eliminates the need to keep the connection information available.
- **Support for ArcGIS Pro 3.x** - You can now access your enterprise geodatabase using TBC with the latest version of ArcGIS Pro 3.x installed. After upgrading, you can continue to work with existing TBC projects the same as before.
- **Export feature definitions and schema to a geodatabase** - The Geodatabase XML exporter has been enhanced to enable you to export your project's feature library schema and data differently. Three new options have been added:
 - Export all feature definitions - Select to export all feature definitions, including those definitions that do not include attached data.
 - Export standard tables - Select to export standard tables and definitions for polygons and polylines.
 - Export schema only - Select to export the feature library schema only, without attached data.

CAD

- **Enhanced color display for BIM objects** - The BIM Object Properties pane has been enhanced to allow you to optionally change the original colors applied to imported IFC linework and meshes for viewing in the Plan View and 3D View in TBC. These enhancements make it easier than ever to highlight specific BIM objects as necessary to meet your specific needs.
- **Create composite geometry** - The new Create Composite Geometry command enables you to combine simpler geometric objects, such as lines and/or polygons, into a single multipart geometric object used to represent complex spatial features, including objects with "holes" through them, such as bridges and archways. Note that when exchanging data with a GIS data source using the Read Features from GIS command or the Write Features to GIS command, you can specify to include composite geometry. (See also "Exchange composite geometry and curves with a GIS data source" earlier in these *Release Notes*.)

Data Exchange

- **Enhanced Connected Workspace** - The Connected Workspace command now provides full, seamless round-trip data synchronization between TBC and Trimble Access—or other project team members running TBC (using their Trimble ID login credentials)—via the Trimble Connect cloud platform, ensuring a smooth, safe, and efficient workflow when exchanging all types of project data.

Connected Workspace enables you to create Workspace projects into which Job data can be uploaded from Trimble Access, stored in the project, and imported into your TBC project at any time. In addition, multiple project-related file types can be uploaded and stored in your Connected Workspace project and then, as necessary, either imported into your TBC project or downloaded to another location.

- **Export Track files** - Export alignments and other linear entities in your project to a Track (.track) file that can be imported into Trimble GEDO rail track measurement system software.
- **Cubic panoramas exported with complete pixel data** - Cubic panoramas, such as those imported from Trimble X-series 3D laser scanners, are now exported from TBC with a fixed size instead of being sized dynamically as is done with spherical panoramas. This ensures cubic panoramas are exported to their full extent.

Photogrammetry

- **Aerial image processing enhancement** - The processing of drone imagery using the Photogrammetry module has been greatly enhanced to support complex projects, particularly those with non-nadir imagery. This enables the processing of inspection and 3D projects, such as bridges and steep open-cast mines, creating true 3D point clouds and meshes. And to help simplify your aerial photogrammetry work, the Flight Mission Adjustment report has been redesigned to make it easier to read and understand.

- **Streamlined photogrammetry deliverables workflows** - The Create Deliverables command in the Photogrammetry module, which is used to create point clouds, elevation rasters, orthomosaics, and/or 3D meshes from aerial survey data, has been redesigned to enable you to select one of two workflow options that automatically change the layout of the command pane and the controls displayed based on the type of deliverables you want to create:
 - **Mapping** - This layout enables you to create either a 2.5D point cloud, true orthomosaic, and/or 2.5D mesh for a digital surface model (DSM), or a DTM point cloud, elevation raster, and/or DTM orthomosaic for a digital terrain model (DTM), all of which can be used for a variety of aerial mapping needs.
 - **3D Modeling** - This layout enables you to create a 3D point cloud and/or a 3D mesh* that can be used for aerial inspection work. (*See "Create 3D mesh photogrammetry deliverables" later in these *Release Notes*.)

Having two specialized workflows is like having two commands in one, enabling you to focus on and create just the point cloud deliverables you need quickly and easily without navigating through unnecessary controls and parameter settings.

- **Create 3D mesh photogrammetry deliverables** - When creating photogrammetry deliverables using the Create Deliverables command with the Digital Surface Model elevation type selected, you now have the option to generate a 3D mesh from the model in a variety of formats that can be exported and viewed in other applications. A 3D mesh is the structural build of a 3D model consisting of polygons and surface faces.
- **Enhanced 3D visualization of aerial imagery** - You can now view images and wire frame cones of images/cameras in the 3D view, improving the orientation and visual impression of aerial photo data. This is especially helpful when working with 3D aerial inspections.
- **UAS support** - While the Photogrammetry module has been designed to support the importing and processing of UAS data from all drones with frame-based cameras, support for the following drones was specifically verified for this release in cooperation with the drone vendors and/or with Trimble resellers officially supporting these drones:
 - Skydio
 - Wingtra RGB61
 - Autel XL705

Point Clouds

- **Extract railway features** - The Extract Classified Point Cloud Regions command has been enhanced to extract rails, sleepers, and ballast railway feature classes from a point cloud: Rail and sleepers extraction is performed using 3D deep-learning models. Ballast extraction is based on the algorithmic approach and is performed on the downsampled point cloud between specified offset distances from the rail or trajectory. A trajectory or linestring can optionally be used to (1) improve performance by limiting the extraction search area, and (2) to have more control over ballast extraction.
- **Enhanced classification of aerial point clouds** - The Extract Classified Point Cloud Regions command has been enhanced to employ 3D deep learning models to more accurately extract an expanded list of classified regions from a point cloud created from aerial photogrammetry and/or Lidar data.
- **Dynamic cell sizing when filtering point clouds** - The Advanced Point Cloud Filtering command now provides a "smart sampling" option that automatically applies a dynamic cell size as necessary to account for fast elevation changes in your point cloud. The default cell size you specify for filtering (one point per cell) is dynamically decreased as necessary to include more points on inclines, helping to ensure data precision.

Tunnels

- **Create vertical shaft tunnels** - The new Create Vertical Shaft Tunnel command enables you to create a vertical shaft tunnel using the same familiar tunnel creation and editing tools currently used to create "horizontal" tunnels, and following a similar workflow. Vertical shafts are common in tunnel and underground mining construction to allow construction or extraction to be started at lower depths.
- **Extract classified tunnel point cloud regions** - The Extract Classified Tunnel Regions command has been enhanced to now support two methods for extracting classified tunnel point cloud regions:
 - **Basic** - Select this method to perform a basic extraction of the tunnel's shape and bottom into new classified point cloud regions. This is optimal for TBMs (circular) and inspection of existing tunnels.
 - **Advanced** - Select this new method to use deep-learning models to perform a more precise extraction of the tunnel's shape and numerous tunnel features into new classified point cloud regions. The features extracted include rockbolts, shotcrete and rock surface, ground, and rebar mesh. This is optimal for conventional excavation, drill/blast construction, and mined tunnels.

Mobile Mapping

- **Custom control PCI heatmaps** - In previous versions of TBC, the Inspect Pavement Condition command provided a single option to create heatmaps for ALL of the sample units resulting from the inspection. This required time and computing resources that may have not been necessary if you did not require a heat map for every sample unit. Now, using a graphic view or the Project Explorer, you can easily select one or more of just the sample units for which you require heatmaps. This option also protects you from losing pavement inspection results in case of unexpected software behavior, particularly when a project has hundreds of sample units.
- **Export pavement condition attributes to GIS** - The Esri File Geodatabase exporter and Shapefile exporter have both been enhanced to enable you to select to export all important polygon and polyline feature attributes extracted for pavement conditions (for example, cracks and potholes) during a pavement inspection, including diameter, height/depth, slope length, severity level, and more, as applicable.

In addition, both exporters now enable you to select to include or not include area, length, and ID attributes for non-pavement condition geometry in the export. (Regardless of this setting, these attributes are always exported with pavement condition geometry.)

- **Enhanced PCI crack detection** - The deep learning model for crack detection has been enhanced to provide a higher detection rate.
- **Recovery of scans after unexpected interruption of TBC** - When TBC generates (or updates) scans (RWCX files), it does so from selected runs, and the generated scans are not saved (in between or at the end of the processing). If TBC is interrupted unexpectedly before the user saves the project, the link with the generated scans is lost.

Load the VCE project in TBC to repair the database:

- TBC automatically recovers the scans generated before the interruption and continues processing the rest of the interrupted run(s).
- It also displays the generated scans in the 3D View and the project tree in the Project Explorer.

Save the VCE project after recovery.

Note: Applicable for all mobile mapping systems except MX7.

- **Generated (or updated) scans are displayed on-demand** - Scans are not automatically displayed in the Plan View once they are generated (or updated). They can be displayed on-demand by activating an option.
- **IRI calculation from mobile mapping data** - Mobile mapping scan data can now be used to compute road roughness conditions. This new IRI feature, combined with the PCI tool, provides to mobile mapping users an ideal solution for road inspection applications. More details on the IRI tool are available in the "Corridors and Alignments" section in this document.

- **Export mobile mapping data to non-proprietary format file** - You can now export processed mobile mapping data (trajectories along with related images and attributes (Euler angles), and time stamps) from your project using a non-proprietary file format.

Third-party tools

UPG and SITECH Construction Systems are actively helping to improve Trimble Business Center (TBC) for users in Australia and New Zealand. As part of this, they are continually developing commands and enhancements for the Australasian market which can be installed as extensions to TBC.

These commands are licensed to the ANZ Toolbox Module, except the 12da Import/Export (Basic) which is licensed to the Viewer. These commands have been added to the toolbox:

- **New ANZ Toolbox commands**
 - **Merge Lines** – The Merge Lines command enables you to select an “original” linestring and a “new” linestring and then remove the section of the original line where the new line is located and use different methods to merge.
 - **Create Best Fit Circle** – The Create Best Fit Circle command enables you to select at least 3 points and fit a circle using least squares method.
 - **Explode Lines** – The Explode Lines command enables you to explode any linework into either all segment elements or segments based on user defined deflection angle.
 - **Slope-Slope Intersection** – The Slope-Slope Intersection command enables you to create new 3D lines at the intersection of two slopes defined by two pairs of lines, with or without vertical or perpendicular offsets. This tool is great for creating subgrade strings at batter intersections.
 - **Offset Slope** – The Offset Slope command enables you to create a new 3D line at an offset and elevation difference to a pair of lines or Ref line with nominated slope. The elevation of the new line is computed by extending the slope defined by the pair of lines and applying the elevation difference required. This tool is great for extending pavement or subgrade strings.
 - **Delete Layers** – The Delete Layers command enables you to clean and/or delete populated layers without the need for them to be empty of objects.
 - **Adjust Area** – The Adjust Area command enables the user to place a new line or polygon that creates a boundary area equal to a value specified. It requires a selection of at least three source lines and a reference line to calculate.
 - **Attribute Editor** – The Attribute Editor command allows you to edit, add or delete “feature attributes” and “12d attributes” on existing objects in TBC. This a flexible way to change current attribution on objects and add “12d attributes” to new objects.

- **Find and Replace Text** – The Find and Replace Text command allows you to perform a simple search and replace of text objects and add a prefix and/or suffix to existing text.
- **Explode Text** – The Explode Text command enables you to explode any Text item into linework. This allows for better presentation and export for some 3rd party packages.

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

Microsoft operating system:	Windows® 10 (64-bit version) Windows 11 (64-bit version)
Processor:	Dual-core 1.80 GHz or better recommended Quad-core 2.80 GHz or better (additional cores with hyper-threading support highly recommended for Aerial Photogrammetry, Mobile Mapping, and Scanning modules) Important! Because components of TBC make use of Intel-only multi-thread processing, AMD Ryzen processors are not supported.
Random access memory (RAM):	4 GB or more recommended 32 GB or more recommended for Aerial Photogrammetry, Mobile Mapping, and Scanning modules
Hard disk space available:	30 GB or more recommended 100 GB or more on solid-state drive required for Aerial Photogrammetry, Mobile Mapping, and Scanning modules The recommended SSD overall hard drive capacity is 500GB or more for Aerial Photogrammetry, Mobile Mapping, and Scanning modules

Monitor:	1280 x 1024 or higher resolution with 256 or more colors (at 96 DPI)
I/O Ports:	USB 2.0 port required if HASP hardware key is used
Graphics:	<p>DirectX 11 compatible graphics card with 512 MB memory or more</p> <p>OpenGL version 3.2 or later required when working with point cloud data (latest version recommended)</p> <p>8 GB or higher graphics card (for example, NVIDIA Quadro P4000) recommended when working with Aerial Photogrammetry, Mobile Mapping, and Scanning modules</p> <p>Note: 6 GB or higher NVIDIA graphics card with CUDA compute capability (5.0 or higher) required when working with point cloud classification.</p> <p>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.</p>

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.)

